

THE CONDOR

A Magazine of Western Ornithology

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A QUEST FOR A CONDOR

By BAYARD H. CHRISTY

I wished to see a Condor. An easterner, about to go on a visit to California, I took counsel, and a Los Angeles friend, who besides being a good field ornithologist is a skilled aviator, proposed that we fly for Condors: he too wished to see Condors, to find some spot frequented by them, and having found it to return to it on the ground and to take motion pictures. It was a generous proposal and hospitable, and adventurous as well, all in the best western tradition; furthermore, it was a proposal in which lay a certain suitability; it seemed fitting that, on his newly found wings, a man should match himself against the incomparable aviator of the mountains.

And fly we did. We climbed the heights, we whirled along bumpy crests, we swung across giddy precipices; we looked down upon miles and miles of steep-walled cañons and wedge-shaped ridges, rugged, scantily forested, gray and green below, pink and lavender afar: an inaccessible land, yet alluring; hellish, yet beautiful. High in the air, a great hawk flapped as we rushed by; but not a Condor did we see: no great body perched upon a crag; no wide-spread set of wings. It was a thrilling, and, to a novice, a somewhat alarming adventure, but, as for the object of search, it was quite fruitless. Where were the Condors? This was their homeland; here was their fastness; but where were they? Gone to some far feeding-ground? roosting undisturbed in the crevices of the rocks? or sailing high in the empyrean above? One surmise seemed as good as another.

My friend wished to try again another day, but my time was brief, and I was eager now to come afoot within the confines of Condor-land, that I might at least gain more intimate knowledge of their habitat, and, perhaps, by good fortune, come upon some of the birds themselves. An early morning, then, found me, in company with a well-informed ranchman, mounting a trail through one of the very cañons over which a few days before I had flown. It was a deep and winding chasm; a clear river poured down a rock-strewn bed, and rested in frequent green-fringed pools. The river nurtured a strip of shadowy forest, and high on either hand rose vast cliffs of red sandstone, with such variety of broad walls, clean-cut buttresses, and slender spires, such range of color, from pale hematite red, to distant rose and lilac, as to astound and delight a stranger. Here in the forest, on a sycamore bough which overhung the trail, a hummingbird had shaped her cup of down; there on the red cliff a patch of white spreading from a high ledge marked the eyrie of some

great bird of prey. In the dust of the trail were deer-prints; plume-tailed ground squirrels scampered to cover; as the heat of the day increased, lizards scurried in the dry and rocky places; yellow and black-laced butterflies floated in the shadows; tawny dragonflies darted in the sunlight.

After following the trail far beyond even the fishermen's camps, and while the morning still was young, we reached a narrow bench where stood the derricks of a now abandoned oil-working. Here the cañon widened and the walls receded to distant heights. My guide declared we could do no better than rest at this point and wait, in the hope that the great birds we were searching for would now themselves appear. We settled ourselves, therefore, comfortably upon the table-like face of an upturned spool for oil-well cable. Behind us the ground fell steeply to the stream a hundred feet below; before us rose an arid slope, rough with scattered boulders, tangles of greasewood, and the juiceless, barbed fruitage of the desert; a half-mile beyond stood the great precipice, rosy in the sunlight; a parapet of square-cornered rock masses towered sharp against the sky. The susurrus of the rushing stream filled our ears endlessly; the light airs carried a faint fragrance of sage.

We searched our surroundings near and far: by squeaking we called up, in the thickets about us, Wren-tits, Goldfinches, a Gnatcatcher, a Black-headed Grosbeak, a San Diego Wren; far away a Golden Eagle swung into the cañon and perched on an outstanding crag; a Cooper Hawk rose, turned high in air, and was off; a pair of Band-tailed Pigeons hurried by.

My companion had knowledge of the precipice; he pointed out a high ledge where Prairie Falcons nested, and told me of seeing these fierce birds dash out to drive away a passing Condor; and, after we had waited for a fruitless hour, he proposed that we climb and reconnoiter. We mounted to a higher bench and again settled ourselves on a great boulder, whence we could survey the precipice to its very base, and at once we discovered the Condors.

A large spruce tree, blasted and half dead, rose at the base of the cliff, and, perched upon its bare limbs, were two of the great birds. One stood with wings extended, in the posture of an eagle on a coin, facing the sun; the other was craning his coral-orange head anxiously, disturbed, manifestly, even by our distant approach. Presently he was off. With deliberate and consummate ease he launched himself, flapped with slow wing-beats, and, gaining headway, swung on full-set pinions across the face of the rock. An astonishing spectacle! The wide, black wings with patches of white beneath, inclined slightly upward and reaching noticeably forward; the bright orange head; the great form, adequate to the mighty mountain scene; a display of unmeasured power and perfect grace! Here was the flier for the mountain spaces: the hummingbird for the sycamore's shade, but, for the crags, the Condor!

Our bird rose to a perch at the brink of the precipice and, as he passed their ledge, out sprang the falcons. Though they made no attack, they manifestly were perturbed; they did not like the intrusion. With their pointed wings, and of inappreciably lesser size, I should not have known them from peregrines. Again the Condor flew; and this time, swinging through a wider arc, he rose above the cañon wall, and came, breasting the wind, in seeming slow but sure and level progress, until, having passed the place where his mate was perched, he turned away and disappeared. Half an hour later he returned, perched on the parapet, and at length sailed grandly above us to the opposite side of the cañon.

Meanwhile his mate remained on the perch where we had discovered her. My guide spoke with authority, and averred that the sexes are identical in appearance; and yet I believed myself justified in my distinction between them. Both were adult

birds. Their perching tree was much frequented; its limbs gleamed, polished by wear. Somewhere in that great cliff was their nesting place; even yet, in mid-September, their single nestling might be still continuing in his natal cave, unfledged. Assuming them to be a nesting pair, it was fair to infer that the warier bird was the male; and that it was the female which continued more courageously on guard.

Major Allan Brooks's pen drawing of a Condor in flight, in Mr. Ralph Hoffmann's "Birds of the Pacific States," seems to me to be as adequate as a drawing could be, with one possible qualification: the bird as I observed it flew as a crane flies, with neck outstretched, not retracted, as Major Brooks shows it to be. Perhaps, however, different postures are assumed under different circumstances.

Of the habits of Condors not a great deal seems to be known. Their rarity, the inaccessibility of their haunts, the wideness of their range individually, beyond the power of the observer to follow, all tend to maintain the mystery which surrounds them. Though I do not know, I surmise that, when we swept overhead in the aeroplane, these Condors were there, perched where the ranchman and I afterward found them. And, if that be so, the aeroplane may, after all, be found to be of little avail to aid in dispelling the mystery.

Sewickley, Pennsylvania, September 17, 1931.

DAVID STARR JORDAN AND HIS INTEREST IN BIRDS

By BARTON WARREN EVERMANN

I first met Doctor Jordan in the spring of 1877. During the previous winter my wife and I had been teachers in the Camden, Indiana, public schools, and I had arranged to spend the summer vacation in Indianapolis as agent for Wilson, Hinkle & Co., school-book publishers of Cincinnati.

As our vacation would be a rather long one—from March to September—Mrs. Evermann suggested that we live in Irvington, four miles east of Indianapolis, and that she enter Butler University, located there, as a student. We both agreed that that would be a fine thing to do, so we went out to Butler to look the situation over. We called at the President's office. The President was out of town, and we were advised to see Professor Jordan who was acting president for the time being. When we entered the room to which we were directed, we saw a tall young man seated, writing, at a small narrow table facing the door. He had light colored hair, equally light, sparse beard, and was wearing a light gray suit. He was seated well down in the chair, with his legs well under the table.

He looked up as we approached and, in his efforts to get his feet and legs from under the table, almost upset it! Mrs. Evermann explained to him that she wished to register as a student, and that she wished especially to get work in English literature and botany. When she mentioned botany he seemed pleased; he said that botany was one of his subjects, and that she might enter his class at once.

When we asked where we could get room and board he suggested that his friends, Dr. and Mrs. A. W. Brayton, were living at Mrs. Beadle's and he thought Mrs. Beadle had an extra room we might get. He remarked that the Braytons were both enthusiastic botanists and, withal, very charming people, which we found them to be; that he and Mrs. Jordan and a young special student of his, Charley Gilbert, lived next door to the Beadles, and that they all, including the Braytons, took their meals there.

As all were then enthusiastically collecting and studying plants and birds, he suggested that Mrs. Evermann might find it pleasant and worth while to join the group. She did so. All of them, including Professor Jordan, were doing a great deal of collecting of plants and birds that spring, identifying the specimens obtained, pressing the plants for the herbarium and skinning the birds for study specimens. The wild flowers were at their best, and the air was fragrant with the sweet odors of spring. The spring migrations were at their height, and the woods were filled with beautiful warblers, thrushes, tanagers, orioles and hummingbirds. Brayton and Gilbert did most of the actual bird collecting, but Professor Jordan sometimes himself took a hand, and all took part in identifying and skinning the specimens collected.

This was a wonderful opportunity for Mrs. Evermann and she became an enthusiastic student of botany and ornithology. As a prize for the most satisfactory progress in botany and ornithology made by any member in the class, Dr. Jordan presented to Mrs. Evermann a copy of the first edition of his "Manual of the Vertebrates of the Northern United States," which had just been published, an honor which she greatly appreciated. By September she had a collection of more than a hundred bird skins, many of them prepared under the instruction and sometimes with the actual help of Dr. Jordan or others of the group; for Brayton, Gilbert, Mrs. Jordan and Mrs. Brayton were each able to make very good study skins.

Dr. Jordan's interest in ornithology began very early, when a young boy on the old farm near Gainesville, New York. Writing of his boyhood interest in nature, he said: "Toward geology and ornithology I had meanwhile felt a growing attraction". While in the Indianapolis high school and at Butler College, as a teacher, he made constant use of ornithology as a means of developing in his students a live and abiding interest in systematic zoology. Writing of those days he said: "In connection with my work, I interested several of my students in the field study of birds. The tall trees of Maywood down the White River were the favorite resort of the migrating warblers, and nearly all the species that cross Indiana could be found there. I know of no finer out-of-door study than ornithology. It has, however, the almost fatal drawback that to secure any degree of thoroughness, one must kill. Dealing with such highly developed organisms is and ought to be painful. Someone has said that in shooting a wood thrush one feels he has destroyed a 'superior being'. I never killed anything for the pleasure of it, and since 1880 I have not even owned a gun nor fired a shot at any living creature; my last attempt was directed at a California Burrowing Owl which got away with its life. But in 1874 to 1876, in Wisconsin and Indiana, I made large collections of birds, and prepared a series of descriptions for my first real contribution to science—'A Manual of Vertebrates of the Eastern United States', published in 1876."

It should be mentioned, however, that two years earlier (1874) he had prepared and published a small booklet entitled: "A Popular Key | to the | Birds, Reptiles, | Batrachians and Fishes, | of the | Northern United States, | East of the Mississippi River." | By | Prof. David S. Jordan, M. S., | and | Balfour H. Van Vleck. | Appleton, Wis.: | Reid & Miller, Printers and Publishers. | 1874.

This little book, of which Dr. Elliott Coues said "the less said the better, except that it paved the way to the excellent Manual of Vertebrates", contains 88 pages (of which 34 are devoted to birds) plus 16 pages containing a key to the Fishes of the Great Lakes, plus 4 pages of advertisements. The page is $5\frac{3}{4} \times 4\frac{1}{2}$ inches, and the booklet in paper cover sold at 75 cents.

Soon after Professor Jordan came to the Indianapolis high school he was joined by Herbert Copeland, a Cornell chum, and the two lived together in Indianapolis for some months during which he says: "We resumed our studies of flowers and birds begun at Cornell and continued in Wisconsin."

In my days of close association in the field with Dr. Jordan, and they have been many and in many countries, he was always interested in the birds we saw. Of those seen in Indiana and New England and in the central and southern states, he knew most of them at sight. Those about Indianapolis and Bloomington and elsewhere in Indiana, he knew most intimately. But wherever we went and whatever species he saw (and he could see about as many as any one else) he would make interesting comments and often have interesting stories to tell.

Although he did no actual collecting of birds after 1880, he never ceased to enjoy seeing the birds and hearing their song. He was a real naturalist who was able to find "Nature when out of doors" and able to interpret her ways.

California Academy of Sciences, San Francisco, November 22, 1931.

OBSERVATIONS ON SOME BREEDING BIRDS OF EL SALVADOR, CENTRAL AMERICA

WITH THREE ILLUSTRATIONS

By ALDEN H. MILLER

The observations to be presented are those made during a summer visit to the country of Salvador, Central America, in the year 1925. On this trip I was accompanied by my father, Dr. Loye Miller; later we were joined by Mr. A. J. van Rossem and Mr. R. A. Stirton who have collected extensively in Salvador in the interests of Mr. Donald R. Dickey. The skins collected by myself which are the basis for the identifications of the species here listed are now in the Dickey collection. The identifications have been furnished by Mr. A. J. van Rossem who has intimate knowledge of the nomenclature of the birds of this region. My notes on many of the species are regrettably incomplete but it is hoped that they may furnish usable information about some of these little-known birds.

Two collecting stations were made during the summer, the one between the towns of Sonsonate and Izalco in the west end of the country from July 9 to 25, and the second at Lake Olomega, near the seaport of La Union at the east end of the country from July 28 to August 24. The country about the Sonsonate station consists of rolling hills with cultivated fields and pastures cut through by wooded ravines and interrupted by tracts of woodland and by coffee plantations. At Olomega there is a fairly dense subtropical forest around the borders of the lake. On the



Fig. 1. NEST AND SET OF FOUR EGGS OF MEXICAN GREBE, *Colymbus dominicus brachypterus*; LAKE OMEGA, SALVADOR, CENTRAL AMERICA; PHOTOGRAPHED AUGUST 8, 1925.

north side near the inlet there are considerable areas of marsh; to the south, hills a thousand feet or more in height rise fairly abruptly from the shore of the lake.

Colymbus dominicus brachypterus. Mexican Grebe. This grebe was found breeding on Lake Olomega on August 1 when a nest containing slightly incubated eggs was collected (figure 1). Nests were placed among the floating water plants

which grew to a height of not more than three inches above the water in a zone extending about one hundred yards off-shore. This floating vegetation also was the center of the breeding Jacanas of the lake (see A. H. Miller, Condor, xxxiii, 1931, pp. 32-33). On August 8 as our party entered the fringe of vegetation a number of Mexican Grebes flew ahead of the boat. On this visit seven nests were located in the immediate vicinity, all of which contained fresh eggs, some of the sets being incomplete. Either three or four eggs constituted a complete set, usually the latter.

The nests consisted of fresh, neat piles of the surrounding water plants. They were about one and a half feet in diameter, although only six to eight inches across at the surface of the water and consequently not readily visible. Not uncommonly the nests were surrounded by converging passageways through the surface vegetation, these passageways being formed by the birds as they swam to and from their nests. The eggs in the nest occasionally were left uncovered, but in most cases, probably when the incubating bird was not suddenly alarmed, they were covered in the customary grebe fashion by drawing part of the vegetation from the edge of the nest over them.

Adult birds were wary and, rather than dive upon the approach of danger, readily took to wing. It was thought that this method of escape might be made necessary by the thick growth of water plants beneath the surface. Nevertheless, the vegetation seemed to be no thicker than that through which I have frequently seen *Podilymbus* penetrate while escaping under water. This proneness to take wing was more pronounced than in any of the species of North American grebes with which I am acquainted. I can scarcely concur with Bent in his statement (U. S. Nat. Mus. Bull., 107, 1919, p. 38) that this form is hardly able to rise above the surface of the water and that it is poorly equipped for migratory flights. It seems at least to be on a par with other grebes as regards flight.

On August 19, grebes were laying second sets in old nests from which eggs had been taken on August 8. Three days later a male grebe was shot while carrying newly hatched young on its back. This adult did not dive when shot and as it was being retrieved, one of the young wriggled out from under its wing. A few feet away another young was found dead. The other adult had been swimming nearby but flew at the sound of the shot while the two young accompanying her dived, coming to the surface in a few seconds although exposing only the tops of their heads.

Phalacrocorax olivaceus mexicanus. Mexican Cormorant. Cormorants were abundant on Lake Olomega, and on our arrival on July 28 many brown immature birds were noted among the flocks of adults. Frequently the birds would group together on the surface of the water while following a school of fish, flapping and lunging as they swam and tumbled after their prey. This action is clearly the same as that described by Nelson (Condor, v, 1903, p. 141) and appears to be more prevalent than in *Phalacrocorax auritus auritus* which Lewis (The Natural History of the Double-crested Cormorant, 1929, Ri-Mi-Lou Books, Ottawa, Canada) recently has studied so fully.

On August 3, I visited the cormorant rookery on a wooded peninsula of one of the large islands in the lake. A small flock of Egrets and Little Blue Herons roosted in this rookery but did not appear to be nesting. On this day many of the cormorants were paired and were occupied with nest building. I saw no eggs in any of the accessible nests (see fig. 2). The trees on a large part of the peninsula, an area about three or four acres in size, were covered with the excrement of the

cormorants, which was gradually killing the trees and the undergrowth. As the trees died, they became heavily infested with termites and ants which hastened their falling and made climbing exceedingly difficult. The nests were placed from thirty to fifty feet from the ground, often in the branches of the crowns of the trees.

On August 18 a second visit to the colony revealed a four fold increase in the number of nests. Green trees were being occupied for the first time along the borders of the old colony. Sets of eggs were in the process of completion. Complete sets were either of three or four eggs. The nest sites in the tops of the trees apparently were the favorite locations, for these places were used first and consequently the sets here were completed and often slightly incubated. The nests built since August



Fig. 2. NESTING COLONY OF MEXICAN CORMORANT, *Phalacrocorax olivaceus mexicanus*; LAKE OLOMEGA, SALVADOR, CENTRAL AMERICA; PHOTOGRAPHED AUGUST 18, 1925.

3 were either in new trees or at lower levels in the older sections of the colony. In the oldest parts of the rookery several trees containing old nests were breaking down and, therefore, were deserted by the cormorants.

There was always a great amount of squabbling to be heard and the characteristic grunting of this species in the aggregate at times became almost deafening. The roar from the colony could be detected for several hundred yards as we approached across the water. Where nests were located near one another, the incubating cormorants reached across to strike at neighboring birds. They seemed restless while we were present and continually craned their necks about to watch us. Although bothered by our presence, they did not flush from their eggs until the trees in which they were located were partly climbed. The birds once having flushed re-

turned and sat near-by fluttering their gular pouches and holding their mouths open. Most of the adults possessed white nuptial plumes on the sides of the head and neck.

Even with the trees more crowded with nests than at an earlier date, no nests were seen lower than thirty feet above the ground. The crowns of a few trees were almost solid with nests. A typical nest was thirty inches across and half as deep, with a cup of not more than two or three inches. A few were considerably larger and deeper while others were little more than flat platforms. By the time sets were completed the nests became cemented by excrement into hard solid masses. Birds were seen flying about the colony with green twigs in their bills, and on August 3, when the place was first visited, many cormorants flushed from the ground among the bushes where they were gathering nest material. They did not fly directly to the nests from the ground but circled out over the lake gaining altitude and returning to the tree tops. Birds also were seen to pull off growing twigs while they were perched in the trees.

The usual forest bird life was absent among the trees of the colony. A few Black Vultures were present and a single hummingbird was noted in the bushes beneath. The cormorants were in full possession of the peninsula and indirectly had driven out many other bird species.

***Butorides virescens maculatus*.** Central American Green Heron. Green Herons were fairly abundant at Lake Olomega where several nests were found. Apparently the nesting season there was of considerable length as nearly fresh eggs and fully grown young were observed during the first half of August. One nest was discovered in a clump of mimosa which was growing on flat ground near the lake shore. This thorny thicket was nearly impenetrable to human beings. The nest was only five feet above the ground, being two feet below the bush tops. The construction was typical of the species as it is known in North America, being the usual scanty framework of twigs. The two eggs in the nest were left untouched for three days; with no further additions they were collected on August 1, at which time they were slightly incubated.

On July 31 three pairs of nesting Green Herons came to my attention on an island not more than seventy-five yards in length. One nest four feet above ground in a thorny bush was occupied by a six foot snake that was devouring the heron's eggs. The other two pairs had young nearly ready to leave the nest. The adults were exceedingly solicitous and came close to the nest as I examined their young. These two nests were situated about ten feet above the water's edge in small trees, much as I have been accustomed to finding nests of *B. v. anthonyi* in California.

***Ionornis martinica*.** Purple Gallinule. This gallinule always was found in the clumps of hyacinths growing along the north shore of Lake Olomega (see fig. 3). Although the birds were found in other types of cover, this seemed to be their particular habitat. Their concentration in the hyacinths gave the appearance of a colony, since three nests were found in one patch of this growth not more than fifty yards across and many other pairs were flushed from the same patch. On August 1, one of these nests contained three piped eggs and one addled egg, a second nest contained a set of six fresh eggs, while a third held the remains of a partly destroyed set at a point where a breeding female had been collected three days earlier. The nests were above the level of the shallow water in open locations and were resting on the matted, rigid, thick stems of the hyacinths which grew to a height of twelve to eighteen inches. They were readily visible from above. Grasses brought from some distance were used in their construction, which material contrasted sharply with the dark green of the hyacinth stems.

On July 29 a breeding female was collected in the mixed immature plumage of the first year. Later, on August 19, fully grown juveniles were taken.

Columba flavirostris flavirostris. Red-billed Pigeon. This species inhabited the small tracts of open woodland at Sonsonate where on July 14 a nest was found. The incubating bird flushed from the nest which contained a single egg and at once disappeared from sight in the woods. The nest site was in a row of trees along a fence between two pastures and at the edge of a small wood. The nest was placed on a flat branch twelve feet from the ground and was extremely crude. It seemed to be even more frail than the nests of the Band-tailed Pigeon which I have examined,



Fig. 3. VIEW SOUTHWARD ACROSS LAKE OLOMEGA, SALVADOR, SHOWING GROWTH OF HYACINTHS OCCUPIED BY PURPLE GALLINULES, *Ionornis martinica*; PHOTOGRAPHED AUGUST 8, 1925.

the egg being plainly visible from below. On July 1 there was still only the one egg in the nest. After collecting the egg, a count of the number of sticks used in the nest yielded a total of forty-five.

Columbigallina passerina pallescens. Mexican Ground Dove. This bird was common about the fields at Sonsonate and in the more open tracts of forest and grassland at Lake Olomega. Four nests were found at Sonsonate, all of which were located from three to five feet up in bushes on hillsides in fairly open pasture lands. In two instances pairs engaged either in nest building or laying were being followed by fully grown juvenal birds which begged for food from the adults. On one occasion one of these juveniles was shot to make certain of its age. The usual two white eggs always constituted a set.

Several nests were found at Lake Olomega in the palmetto clumps which grew in the open woods near the edge of the lake. The nests in some instances were placed as high as eight feet above ground.

Scardafella inca. Inca Dove. This species, although common at both Sonsonate and Olomega, did not appear to be nesting in any such numbers as were the Ground Doves. One nest only was found on July 21 at Sonsonate. It was placed in a small climbing vine in a ten-foot bush which stood on a hillside scattered with bushes four feet or more in height. The nest was four feet from the ground and consisted of a small mat of grass with a few twigs, indistinguishable in its construction from nests of the Ground Doves. It contained two fresh eggs. The incubating bird remained on the nest until I approached within two feet.

Leptotila verreauxi bangsi. Bangs White-fronted Dove. White-fronted Doves were noted occasionally in the dense timber at Sonsonate, but were more common in the jungle along the south shore of Lake Olomega. One nest was found by Loye Miller at the latter station. It was placed four feet above ground in some brush and vines in the deep woods on a hillside near the lake. The trees overhead were at least sixty feet tall. Upon leaving the nest the dove flew up into the tree tops. The nest was composed of sticks and the tendrils of vines and was as frail as nests of Mourning Doves. The two eggs were about one-third incubated on July 28 and unlike the eggs of most of the other doves and pigeons were a distinct light tan in color rather than white.

Geococcyx velox. Lesser Road-runner. On a small peak southeast of Lake Olomega, Lesser Road-runners were found breeding. At an elevation of 1600 feet the dense tropical forests of the lowlands give way to open grassy hillsides with scattered trees not more than twenty feet in height. The road-runners occupied these grassy areas on the steep hillsides. The first nest was found by Stirton on August 4 and at the time contained one egg. On August 7 this nest had only two eggs which were collected. The incubating bird did not flush from the nest until I touched the tip of its bill, in this respect being similar to the California Road-runner. When disturbed it flew seventy-five feet horizontally before dropping to the ground and disappearing in the tall grass. In fifteen minutes a road-runner appeared in the grass at the point where the bird had been seen formerly. Presumably it was the same individual. When it was collected, it proved to be a male with incubating patches on the belly. No other bird appeared during the next two hours while I waited at the nest. Possibly some accident had befallen the female. This nest was situated six feet above ground in a small bushy tree and was plainly visible from a distance of fifty yards. The material making up the nest was finer than that ordinarily employed by *Geococcyx californianus* and the entire structure was more compact and stronger, although smaller, than the nests of the more northern species. Several old nests of similar construction were seen in adjacent trees.

A second occupied nest containing two eggs was found on August 12 in a similar location in a low bushy tree. This nest was made of even finer material than the first, although not as compactly built. The incubating bird was shot on the nest and proved to be a female with small ova and large incubating patches. The eggs were about one-third incubated. A mate was not seen although no systematic search was made to find him. The stomach of the female was filled with grasshoppers.

Although the actions of the Lesser Road-runner while running and while in flight are very similar to those of the California species, the fact that these Central American birds appear not to lay their eggs at protracted intervals indicates a difference in breeding behavior. The second set of two eggs was, without doubt, complete and the first set also may have been complete. In *Geococcyx californianus* four to eight or more eggs normally are laid, but, as in some other cuckoos, they are deposited usually at intervals of several days so that young of various ages as well as eggs occur at one time in any given nest. Often the eggs of *californianus* are laid in groups of two, the eggs of each group being deposited on successive days and not followed by more eggs until three to five days have elapsed. May it not be that several of the sets of two eggs as laid by *G. velox* have become crowded, so to speak, into one protracted laying period in the related species *californianus* which because of its more northern habitat is limited to a shorter breeding season. According to Bancroft (Condor, xxxii, 1930, p. 27) *californianus* in Lower California may lay

complete sets of two eggs as does *velox*. Possibly there is to be seen in *californianus* a rather unusual intermediate step between the small sets characteristic of the tropics and the larger sets of the temperate regions, or, these peculiarities may be simply another manifestation of the instability in breeding habits for which cuckoos are notorious. That *G. velox* at times lays more than two eggs is shown by Owen's record (Ibis, 1861, p. 67) of a set of four taken at San Geronimo in the adjacent state of Guatemala, which set, it is to be noted, was taken on April 3, over four months earlier than the sets found in Salvador.

Crotophaga sulcirostris sulcirostris. Groove-billed Ani. Anis were perhaps the most abundant of the birds in the fields at Sonsonate and they were common in open localities about Lake Olomega. A number of nests were found shortly after our arrival at the former station, some of which contained eggs. The nests are bulky, loose masses of twigs, roots and thorns with a layer of green leaves lining a fairly deep cup. These leaves are always fresh on the surface but dead beneath if the nest is of any appreciable age. It appears that the birds replace the lining of the nests daily while the sets are being completed. I did not encounter any nests with heavily incubated eggs or young, but I believe that this replacement of the lining continues throughout the period of incubation, certainly for the first few days after the completion of the set.

The eggs, in accordance with the descriptions of other writers, are thick shelled and covered with a white chalky coating which obscures a uniform dull blue-green pigment in the harder parts of the shell. The chalky surface is easily scratched. Eggs even in incomplete sets become scratched by the birds in a more or less equatorial direction suggesting that the scratching results from the actions of the birds in re-lining the nests with leaves. Incubated eggs become heavily scratched, the chalky layer being to a considerable extent removed. Seemingly complete sets of seven, nine, eleven, and thirteen eggs were taken. Several nests were watched from the time there was one egg until there were nine, or in one case eleven, eggs. The eggs were deposited regularly at one day intervals and there was no certain indication in any of the sets, of two females contributing to the same nest as has been claimed by other observers. My findings, however, do not prove conclusively that community nests may not exist, at least occasionally. Incubation is uniform within a set and, correspondingly, birds were found to be incubating regularly only after the sets were completed. In the set of thirteen the eggs were resting in three layers in the necessarily ample cup of the nest.

Nest sites were from two feet to twenty-five feet above ground in almost any kind of bush or tree. Usually they were located between six and twelve feet above ground in thorny tangles or close twiggery. One nest was found, however, in an open crotch of a fan of a royal palm. Adult birds are not much in evidence around nests which are being built or around sets of incomplete eggs. When flushed from sets of complete eggs, they may approach within five feet of the intruder and utter their feeble, squeaking notes of protest.

Synallaxis erythrothorax pacifica. Pacific Rufous-breasted Synallaxis. These "oven birds" were found in the open forests near the lake shore at Olomega, especially in the brushy tangles along the sloughs that ran through the woods. On August 14 the first nest was found. It was located in a clump of bushes five feet above ground which periodically was flooded by the river. Its general appearance was that of the nests of wood rats (*Neotoma*). Within the rough exterior was a well formed, arched-over basket of heavy sticks which held the nest proper. The top of the entire

structure was draped with heavy irregular masses of brush and thorns. Some of the sticks in the structure were more than one-fourth of an inch in diameter and it is difficult to imagine how these small birds, which are the size of a song sparrow, could carry and arrange such large objects. This nest was nearly spherical and about two and one-half feet in diameter. Other nests were of about the same size but not always as perfectly round.

On August 21 the first nest was revisited and found to contain one egg. The top of the nest had been still further covered by a layer of broad bark chips. The lining in the nest was very poor, the egg resting almost directly on large twigs. On August 23 the lining was slightly improved but the nest contained only two eggs which were collected even though it was not certain that the set was complete. The eggs are a deep blue and unspotted, reminding one of the eggs of the Wren-tit, *Chamaea*.

One other completed nest, which contained no eggs up until the time of our departure, had a rather elaborate lining of shredded bark and snake or lizard skins. This nest was eighteen feet above the ground in a tree at the edge of a slough. Both birds were seen running over the top of the nest as I climbed the tree in which it was placed. This pair stayed near me as I inspected their nest and made mild protest in the form of soft clear whistles. Full grown juveniles were collected during August, but no nests containing young were found.

Heleodytes capistratus capistratus. Hooded Cactus Wren. Many old nests of the very common cactus wrens were found, but the nesting season seemed to be almost entirely past. The nests were most often placed in thorn trees which made them practically inaccessible. Several nests which the wrens apparently were using regularly as roosting places were watched for ten days or more, no building or egg laying being in progress. One nest with a single young bird nearly fully feathered was found in a palmetto clump at Lake Olomega. Great numbers of juvenal birds were out of the nest, some of which were still being fed by the parents.

Thryophilus pleurostictus lateralis. Salvador Banded Wren. This wren was found only in the forests at Olomega where on July 31 a bird was watched carrying nesting material to a well formed globular nest about twenty feet up in a tree. Two females collected on this date were laying. Several other nests were found on August 10. It was noted that all of the nests found were either purposefully or by chance placed near wasp nests. Old nests that I examined were flask shaped, with the neck curved laterally and downward. They were placed in crotches with the neck or passageway hanging over a limb. One nest found on August 10 contained a single well grown young and one egg which was pure white.

Turdus grayi megas. Central American Gray Thrush. Gray's Thrush or Robin was met with at Sonsonate where it inhabited the open tracts of timber. These thrushes did not frequent the ground as much as *Turdus migratorius*. Their nests were mud cups lined with grass or roots as is customary in this genus. Four nests were found, three of which were near the trunks of trees in the forest. The fourth nest was in a royal palm tree standing in a cultivated field. This last nest was the only one occupied and contained one young and one egg, which latter was heavily spotted with brown, very unlike *T. migratorius* but similar to the eggs of some of the other southern species of the genus. Fully grown young with spotted breasts were shot on July 19 and the nesting season seemed to be about over although many male robins were in full song.

Chamaethlypis poliocephala caninucha. Central American Ground-chat. In the pastures at Sonsonate this little known yellow-throat-like warbler was a fairly common breeding bird. On July 13 a female was flushed from a nest in a small clump of bunch grass. The nest and three well incubated eggs were very similar to those of *Geothlypis*. The nest was composed of the blades of flat sedges and was situated one and one-half feet up in the three-foot clump; it was well hidden and supported by the dense base of the clump. A second nest containing three fresh eggs was found July 16 in a similar location. This nest contained a few cow hairs in the lining which were not present in the first nest. Still another nest was found five days later with four pipped eggs. Thus, the size of the sets appears to be but slightly smaller than in *Geothlypis trichas* to the north. W. DeW. Miller (Auk, xxxvi, 1919, pp. 290-291) has argued for the close relationship of *Chamaethlypis* with *Geothlypis* rather than with *Icteria* and recounts his experiences with these birds in Nicaragua. My observations regarding nests, eggs, and song confirm his views. The birds certainly do not sing or act like chats. Each song is a moderately short, pleasing sequence of notes with none of the variety and few of the qualities to be heard in the chat's song. It is similar to the songs of the Tule Yellow-throat although always distinguishable from them. The ground-chats inhabited low bushes and grass clumps about the edges of the meadows and pastures.

Agelaius phoeniceus grinnelli. Grinnell Red-winged Blackbird. Red-wings were seen by us only at Lake Olomega and there chiefly along the north edge of the lake. Near the hyacinthus where the gallinules were nesting there were growths of reeds and bushes which contained several Red-wings' nests. Van Rossem found one set of three pipped eggs on July 29. Most of the blackbirds had finished nesting, and young and old birds were gathering in flocks in the sloughs and meadows back from the lake shore.

Tanagra cana diaconus. Central American Blue Tanager. Several pairs of these blue tanagers were living about the government houses at our Sonsonate station. On July 10 a pair was seen making repeated excursions to a large royal palm tree. The next day the beginnings of their nest were inspected in this tree; at the time, it consisted of only a small pad of shredded palm bark. It was located twenty-five feet above ground on a nearly horizontal surface of a side branch and was fully exposed to the sun and rain. On July 15 the nest was completed; it was a soft homogeneous cup of palm bark with a little hair intermixed. It contained one egg on this date. By July 18 the set was complete with only two eggs. The eggs were of dull white ground color heavily and fairly evenly spotted with moderately sized dark brown spots.

Guiraca caerulea lazula. Mexican Blue Grosbeak. Blue Grosbeaks inhabited cut-over forest areas and the margins of cultivated fields at both Sonsonate and Lake Olomega. A female which had laid only a few days previously was collected at Sonsonate on July 23.

At Olomega on a cut-over hillside grown up to a height of four to six feet a pair was watched for some time as they sat in the bush tops giving their alarm notes. Finally the female disappeared and shortly was flushed as I proceeded to the point where she was last seen. The nest was well in view near the top of a tall clump of bushes and was composed largely of grass. The cup of the nest was deep and the outside bound together with spider webs forming a compact, strong structure. In the details of construction it was not distinguishable from nests of the race *salicarius* found in California. The nest contained a set of three slightly incubated eggs, a

number often laid by California birds. In fact, there was considerable similarity even between the fairly dense green bushes inhabited by this species in Salvador and the river-side bushes in damp situations that *salicarius* frequents.

Saltator atriceps atriceps. Black-headed Saltator. A nest of this species was found in a mass of vines hanging from a tree in a cañon bottom near Sonsonate. It was eleven feet above ground, well cupped and constructed of tendrils of the vines. The set of two eggs was complete on July 16, when the eggs were one-third incubated. The adults were timid, the female flushing at a distance of twenty feet. On July 15 a Black-headed Saltator's nest was noted which contained large young. The eggs are a pale greenish blue with wreaths of bold black scrawls about the large ends. These saltators always were found in fairly dense, brushy timber, usually in cañons or river bottoms.

Sporophila minuta parva. Richardson Seedeater. This seedeater was found only at Lake Olomega. It was particularly abundant in the clumps of mimosa along the north shore of the lake and on August 4, breeding birds were taken in this region. Several males in breeding condition were in immature plumage resembling that of females. On August 22 a nest with two fresh eggs was collected. The nest was two and a half feet up in an open mimosa bush. It was a small, coarsely woven cup of grass very different from the nests of the Blue-black Grassquit next to be described.

Volatinia jacarini atronitens. Blue-black Grassquit. These small black fringillids were extremely abundant in the three-foot grass in the fields of the Sonsonate district. The males were in full song which consisted, however, of nothing more than a grasshopper-like buzz with an explosive terminal note. The song was given as they sprang into the air from the tops of the grass. The explosive note came as they dropped back to their original perches from a height of about two feet. Each pair appeared to be very local, inhabiting an area which seemed to be no larger than fifty yards in diameter. On July 16 the first grassquit's nest was found; it contained one egg. Two other nests were located during the following two days, one with a set of three eggs, the other empty but new. The nests were neat, thin, wiry baskets of harsh grass and plant fibers which were remarkably rigid even though the bottoms and sides could be seen through. The incubating birds flushed almost under foot as one passed through the grass.

Two sets of eggs numbered three each, and three fully feathered young were found about July 20. These young were heavily infested with some sort of fly larvae which were growing in large skin sores about the heads of the juveniles.

Aimophila ruficauda ruficauda. Russet-tailed Ground Sparrow. This aimophila, which somewhat resembles a White-crowned Sparrow, was an inhabitant of the brush along the stream courses at Sonsonate. Fully grown juveniles were collected July 16, whereas a nest with two fresh eggs was discovered July 19. The set was complete on July 21 when it contained three pale blue, immaculate eggs. The nest site was a crotch five feet from the ground in dense bushes six feet high near the stream and also near a small grassy meadow. The nest was composed chiefly of sticks and hair and was deeply cupped and neatly built.

Museum of Vertebrate Zoology, Berkeley, California, May 6, 1931.

OBSERVATIONS ON THE NESTING OF THE
BLUE-GRAY GNATCATCHER

By MARGARET MORSE NICE

The Blue-gray Gnatcatcher offers a most attractive subject for study because of the ease with which nests can be found during construction, the differences in plumage of male and female, and the tameness of the birds at all times. Yet, strangely enough, almost nothing has been published on the home life of this charming bird. My own observations of *Polioptila caerulea caerulea* have been hampered by limited time and the distance of the nests from my home, the nearest being situated from 3 to 17 miles away. In no case did I use a blind, but sat in full sight of the birds about 20 feet from the nests.

Voice. The real song appears to be given only at the beginning of the nesting cycle. In Oklahoma, I recorded it on April 6, 7 and 24, 1926, on March 29 and 30, on April 5, 9 and 10, 1927, and on June 6, 1929; in Ohio, on June 15, 1929. It is an ecstatic, warbling, high-pitched song, so high-pitched indeed that some of it is often inaudible to human ears. One example that I timed lasted four seconds. I did not hear it from any of the birds I studied; either it had been dropped after nest building was well under way, or possibly it was confined to the early morning hours.

Both birds give the characteristic *spee* with tireless energy. It may be that this constant utterance serves the purpose of proclaiming territory after the early disappearance of the song. I have heard only two other notes from females—a chatter on April 5, 1927, and what appeared to be a courting note, *pee pee-pee*, June 15, 1928.

Males, besides the elaborate song and the three notes mentioned above, have a great variety of utterances. Various little songs have been heard during nest building, an explosive note of anger, and at least ten other expressions, some quite musical, others with more of a sputtering quality.

Nest building. Never were there more enthusiastic nest builders than these little birds, the male in particular bubbling over with excitement. My first nest, 20 feet up in a leafless persimmon south of Norman, Oklahoma, appeared about half done on April 24, 1926. The female uttered *spee* at five of her 12 trips, being silent the rest of the time, while the male gave a number of these notes at every one of his 15 trips (once delivering 17 while in the nest) and also little songs at 7 different times. Both birds sometimes moulded the nest so strenuously that they nearly fell out of it.

The second nest was found a half mile distant April 10, 1927, 10 feet up in a chittim wood; this also was half finished. From 9:40 to 10:10 each parent made 11 trips with tiny shreds; the female was entirely silent, but the male said *spee* every time and once gave a brief song. A Tufted Titmouse alighted two feet from the nest; the male Gnatcatcher dashed at him with an angry sputter and the female also darted at him, but he refused to budge, whereupon the pair left.

Two Ohio nests were nearly completed when found. Nest 5, 40 feet up in a small oak in southern Ohio, was watched from 1:00 to 2:00 p. m., on May 13, 1928. The female made 23 trips, the male 17; she was almost entirely silent, while he *speed* a little and twice gave other notes in the trees but never uttered anything on

the nest. He drove off a Red-eyed Vireo, but made no impression on a Summer Tanager.

Two days later, nest 6, 30 feet from the ground in a small elm in Black Lick woods ten miles east of Columbus, was watched from 9:00 to 10:00 a. m. The female made 20 trips, *speeing* at four of her visits. The male alighted on the edge of the nest but once, immediately flying away; however, he accompanied his mate, *speeing* in the vicinity whenever she was busied with the nest and departing with her on her absences.

At the three nests where both birds were building, trips were made on an average of once in 2.2, 1.8 and 1.5 minutes, respectively; at nest 6 the female averaged a trip every 3 minutes. The close bond between the pair is evident, for in practically every case both were building or both were absent. The male labored equally with his mate until near the end. He never hurried away at the approach of his mate as did a male Bell Vireo (*Vireo belli belli*) whose nest I studied (see Condor, 1929, xxxi, pp. 13-18).

Incubation. In the Arbuckle Mountains in Oklahoma I watched nest 3 for an hour, April 23, 1927; it was placed 12 feet up in a winged elm. The male left the nest at 10:50 as his mate alighted on a branch; she went directly to the eggs. At 11:05 he relieved her, joining her when she returned at 11:24 and both flying off together. The next minute he returned and took charge for 7 more minutes, when she came and incubated until his arrival at 11:50. Thus the female incubated 15 minutes, the male 19, then 7, the female 18. Both birds were comparatively vocal in the home tree, but silent on the nest. These birds were more restless sitters than either of the pairs observed later, and their shifts were shorter. The date would indicate an early stage of incubation.

Nest 4, 20 feet up in a dying elm south of Norman, was unusual in the fact that it did not harmonize with its surroundings. It was watched from 7:00 to 8:00 a. m. May 14, 1927, near the end of incubation. At 7:03 the female approached with several *spees* and the male slipped off with a twitter. At 7:25 there were continued *spees* and the next minute they exchanged places. At 7:55 the female returned with no warning; the male sang *toowy toowy* on a branch two feet below the nest and flew away. Here the female incubated for 22 minutes, the male 29.

On June 2, I spent two hours at nest 6 during the last half of incubation. At 9:05 the female was on; no sound was heard from her mate until 9:31 when a series of *spees* was audible from the northeast, continuing for three minutes and gradually coming nearer. At 9:34 she left and her mate took her place. At 10:08 he flew to the west and immediately afterwards I heard two *spees*. The eggs were left uncovered until 10:12 when the female appeared with three *spees* and settled on the nest. At 10:51 there was another series of *spees* that came nearer and nearer; the female moved about, stood up, stepped on the nest rim, stood there an instant, but slipped down again on the eggs, looked about and then left, saying *spee spee* about 100 feet away. The male stopped his outburst as he reached the home tree and went quickly to the nest. These birds incubated for much longer periods than either of the Oklahoma pairs, the female for more than 29 minutes, the male 34, the female 40. They were also quieter than the others had been.

Although all the birds were somewhat vocal in the vicinity, not a single one gave any note on the nest itself, quite in contrast to Gnatcatcher behavior while building.

It would be of great interest to know much more of the routine of incubation. Is there a geographical difference in habits? Is the day shared fairly equally, or does

one sex assume a larger part? Which bird incubates at night? Is there much variation in the conduct of different pairs? Do the periods change in length as incubation progresses? The whole matter of incubation routine is a fascinating and much neglected subject.

Care of the young in the nest. Two brief periods were spent at nest 4 in Oklahoma, when it had newly hatched young and again three days later. Nest 6 was watched for six hours when the young must have been nearly half grown, three hours the next day and three hours three days later when they were nearly ready to leave. A summary of the chief events at both nests is given in table I.

TABLE I
CARE OF YOUNG IN TWO BLUE-GRAY GNATCATCHER NESTS

Nest No.	Date		Hours	Times fed by		Rate of feeding in minutes		both	Times brooded		Percent of time brooded	Excreta removed by	
				♀	♂	♀	♂		Time	Time		♀	♂
4	May 17	4:53- 5:53	1	4	2	15	30	10	5	37	61.7	0	0
4	May 20	4:08- 5:23	1½	2	7	38	10	8.3	3	37	50.6	0	0
		Total	2½	6	9	22.5	15	9	2	74	.....	..	..
6	June 11	9:00-12:00	3	20	29	9.0	6.2	3.6	8	67	37.2	3	4
6		12:00- 3:00	3	28	34	6.4	5.3	2.9	4	14	14.2	7	0
6	June 12	9:15-12:15	3	35	55	5.4	3.4	2.1	0	0	0	2	6
6	June 15	7:37-10:37	3	46	59	3.9	3.1	1.7	0	0	0	3	3
		Total	12	129	177	5.7	4.1	2.4	13	81	.....	15	13

The parents at the Oklahoma nest were far quieter than they had been while incubating. Although some *spees* were heard in the vicinity, with one exception they were given in a subdued tone. The first day the male twice gave a soft *tingler tingler tee*. During this hour the female fed four times and brooded five times in periods of 8, 7, 5, 10 and 7 minutes. The male fed only twice and brooded three times in periods of 3, 1, and ½ minutes, on each occasion being interrupted by the arrival of his mate. Once a Plumbeous Chickadee began to manifest much interest in the household as the female Gnatcatcher was feeding a tiny insect to the babies; it came closer and closer till the mother left the nest and retired a distance of about a foot. Just as the visitor reached the nest the father of the family darted down and drove it off.

Three days later the female was on at 4:08 p. m. and stayed on the nest till 4:26, the male in the meantime bringing an insect which he gave to her and which she passed on to the young. (Neither of the Gnatcatcher mothers ever ate the food given them by their mates, as the Bell Vireo female often did.) The male fed three times before the female returned to feed and brood after an absence of 26 minutes. She then brooded for 18 minutes, the male giving two meals to her. Once he tried to drive off a Wood Pewee, but the latter turned the tables by chasing him. The female's last brooding lasted less than a minute, while the male did not brood at all.

During three hours in the morning of June 11 the female at nest 6 brooded 37 per cent of the time in 8 periods ranging from 3 to 17 minutes. From 12 m. to 3:00 p. m. she brooded for 10, 2, 4 and 2 minutes only. Sixteen times the male passed the food to her while she brooded. In the afternoon on four occasions they brought food to the nest at the same time; twice he gave it to her, twice he fed it himself. Most of the insects brought by both parents were small, but once the male

gave a comparatively large creature to his brooding mate, whereupon she arose, left the nest, manipulated it with her bill, then flew to a dead branch where she beat it and beat it, eventually flying away with it.

On June 12 the behavior of the parents was much the same as on the previous day except that brooding had been given up, feeding was 76 per cent more rapid and the female had become more vocal. On June 11 she had uttered *spee* after only one-tenth of her feedings, but this day she did so after a third. The male gave this note on both days after about a half of his trips. Seven times they came to the nest together, on three of which occasions the male gave the food to his mate.

Three hours on June 15 showed the fastest feeding I have witnessed with any birds—an average of a meal every 1.7 minutes; but from 9:37 to 10:37, when the female made 20 trips and the male 23, the rate rose to once every 1.4 minutes. The male fed more than the female even after brooding was given up, his rate of feeding for all three days being once every 4.1 minutes, her's once every 5.7 minutes. Forty-four of his meals were given at one minute intervals and 106 or 64 per cent of the total at intervals between 0.5 and 3 minutes. The female brought 12 meals at one minute intervals, and 73 or 60 per cent of her total at intervals between 1 and 4 minutes. A possible explanation of this rapidity of feeding would seem to lie in the very small size of most of the offerings; never did I see more than one insect given at a time and many of the creatures were minute.

On June 15, I measured by stop watch the number of seconds spent at the nest on 7 occasions by the female and 10 by the male. The former were: 8.5, 7, 13, 7, 2.9, 6.5, and 6.9, the median being 7. The latter were: 4.5, 7, 4, 5, 5, 3, 2.5, 4.6, 3.7, and 10, the median being 4.5. Twelve times the parents met at the nest, but the male always gave his food to the young.

On June 12 the young had sometimes uttered a note *jee jee jee* when fed, but on this day they squealed at nearly every meal. By 8:30 they began to give their eager calls before I could see the approaching parent.

One of the greatest changes lay in the parents themselves, for instead of being comparatively quiet they were exceedingly vociferous, giving a great many *spees* after practically every meal and also uttering a new note, *pee pee-pee*, which I took to be a courting note, since the male showed courting behavior on four occasions and the female on six. It may be that much of this vociferousness was due to their beginning a new nesting cycle. However, some birds show an increase of vocal activity the last day or two before the young leave the nest (this has been true in my experience with Song Sparrows, and Magnolia, Myrtle and Black-throated Green warblers). It is possible that both factors were at work.

Periodicity. This species shows a marked periodicity in its activities. Both in building the nest and in feeding young, a number of trips in rapid succession are followed by an absence. The periods of attention and inattention are analyzed in table II. (On June 11 the brooding of the female is disregarded, the data being based entirely on feeding.)

If we consider the three days' records of feeding we find in the attentive periods a steady increase in the total percentage, and a marked increase in the length of periods, but only a moderate increase in the rate of feeding within the periods. In the inattentive periods there is a steady decrease in the total percentage. Comparing the 11th and 12th we find the same number of periods on both days, but a decided shortening of the average time spent away on the second day. On the 12th and 15th these periods are much of the same length, but the number is almost halved on the

TABLE II
PERIODICITY IN GNATCATCHER ACTIVITY

Nest No.	Date	Hours	Attentive Periods						Inattentive Periods					
			Total time			Length			Total time			Length		
			Minutes	Percent	No. of periods	Range	Average	Rate of trips in minutes once in	Minutes	Percent	No. of periods	Range	Average	
			Building											
1	Apr. 24	1	34	58	6	1-9	5.8	1.2	26	43	6	3-6	4.3	
2	Apr. 10	½	27	90	2	9-18	13.5	1.2	3	10	1	.....	3.0
6	May 15	1	26	32	4	1-13	6.5	1.2	34	58	3	4-22	11.3	
Feeding														
6	June 11	6	151	41.9	38	1-19	4.0	1.5	209	58.1	37	3-14	5.7	
6	June 12	3	113	62.8	18	1-12	6.3	1.3	67	37.2	18	3-6	3.7	
6	June 15	3	137	76.2	11	1-38	12.4	1.2	43	23.8	10	3-6	4.3	

last day. During these two days the birds were never away from the nest for more than six minutes at a time.

There are three records available for building, although that of nest 2 is so brief it is of little value except in the rate of trips. Interestingly enough, this is exactly the same in all three examples and also the same as the fastest rate of feeding, namely, a trip every 1.2 minutes during attentive periods. The average length of the attentive periods on April 24 and May 15 is much the same as those on June 12. The inattentive periods on April 24 are the same in length—both the extremes and the average—as those on June 15. On May 15 they average much longer than on any of the other days; perhaps this was due to the fact that the nest was almost completed.

It is of interest to note how Gnatcatcher activity follows much the same pattern both in building and in feeding young. The greater rapidity of feeding as the young grow older comes partly from speeding up the rate of trips, but mostly from a lengthening of the periods of attention. At both these stages in the cycle, male and female are almost constantly together. On April 24 only one attentive period involved the female alone; on April 10 and May 15 both parents were present or absent at the same time. June 15 cannot well be analyzed because of the disturbing factor of the female's brooding. On June 12 during 15 attentive periods both parents were present, and at only 3 did the female come alone. On the last day they both fed during every single attentive period.

In incubation a different rhythm is adopted. There is as much periodicity as ever but the periods are longer and the birds perforce have to be separated. Still the shifts are comparatively short as would be expected from Gnatcatcher temperament.

The intense activity of these diminutive birds is everywhere apparent. Infinitesimal shreds of nesting stuff and tiny insects are brought one by one with none of the labor-saving methods adopted by many birds, of gathering whole mouthfuls of material or food at a time. It would be entirely out of character for the male to sit still and sing for long periods at a time; indeed a ten minute session would be quite unthinkable for him.

I hope that some one with leisure and favorable opportunities will devote himself or herself to a thorough study of the home life of these exquisite birds from the time they arrive in spring to the leaving of the young.

Columbus, Ohio, October 29, 1931.

NOTES ON THE OCCURRENCE OF WATER AND SHORE BIRDS IN
THE LOCHSA REGION OF IDAHO

By R. L. HAND

Fish Lake, in the Selway Forest, lies near the headwaters of the Lochsa River, some twenty-five miles east of the main crest of the Bitterroot Range. At an altitude of 5800 feet, and comprising about 75 acres, it is completely surrounded by rugged mountain ranges. For almost the entire width of the state, east and west, and for at least a hundred miles north and south there are no large, open bodies of water where one would naturally look for waterfowl or waders. The Lochsa River is cut through precipitous cañon walls and in spring and fall is a veritable mountain torrent, while of the numerous alpine lakes, few are more than small ponds, and all are partly hidden by overtowering crags or dense spruce forests.

The records here given are from my notes covering the seasons 1923 to 1929 during which I spent the far greater portion of my time in the mountains of the Lochsa country.

Aechmophorus occidentalis. Western Grebe. On October 17 and 18, 1928, three individuals were seen quietly resting on the lake. Most of the time their long necks were curved over their backs, heads resting far back between shoulders, giving them a peculiar, unbalanced appearance. On October 26 of the same year a lone individual was seen at a small pond five miles from the lake.

Colymbus nigricollis. American Eared Grebe. A fairly regular migrant in September and October. Usually at least one or two are seen whenever a trip to the lake is made during these months and sometimes a dozen or more are scattered over the water. Earliest noted: August 22, 1928; latest, November 3, 1926. Average for seven years: September 14 to October 16. Occasionally noted on smaller lakes or ponds in the vicinity and, rarely, on the Lochsa River.

Podilymbus podiceps podiceps. Pied-billed Grebe. One individual noted twice on the lake, September 25, and again on October 2, 1929. No other records for the Lochsa country, but have been seen on several occasions on the Middlefork of the Clearwater not far from the mouth of the Lochsa.

Gavia immer. Common Loon. On July 31, 1923, a lone individual appeared on the lake and was seen frequently from then on until late September. Other records for the lake are as follows: October 3, 1925 (1); September 19-21, 1926 (2); October 17-18, 1928 (9); October 20 (1); October 10-11, 1929 (1).

On October 18, 1928, I watched nine of the great birds swimming abreast up the lake and diving for the small native trout which abound here. The small inlet toward which the birds were heading was literally alive with small trout and a pair of Mergansers were so intent upon their fishing that they allowed me to approach within twenty-five feet before taking wing.

Mergus americanus. American Merganser. Breeds quite commonly along the Lochsa and is usually seen on this and other nearby lakes from mid-August to late October. Generally in pairs or small parties of up to a dozen or so individuals. Generally speaking, the commonest water bird in the mountains and the one most likely to be seen on the lake.

Lophodytes cucullatus. Hooded Merganser. Rare. Two records: October 18, 1928 (2); October 10-11, 1929 (1).

Not noted elsewhere within a hundred mile radius.

Anas platyrhynchos. Mallard. Irregular, but generally present in pairs and small groups throughout September and the first half of October. Average for 7 years: August 25 to October 12. Extremes: July 27, 1928; October 28, 1927. Noted along the Lochsa in spring and fall but not known to breed anywhere in this locality.

Chaulelasmus streperus. Gadwall. One record only. A flock of 12 seen on July 28, 1926. Viewed with binoculars in good light from a distance of 25 feet. Not noted elsewhere in this locality.

Mareca americana. Baldpate. Generally noted at least once or twice each fall, and sometimes rather common for a short period. On October 3, 1925, about 40 were seen on the lake, but usually they accompany other species in singles or pairs. Average for 4 years: September 20 to October 7. Extremes: August 24, 1928, October 18, 1929. Occasional on other small lakes and casual on the Lochsa.

Nettion carolinense. Green-winged Teal. Irregular, but always present during September and October, usually in groups of five or six to a dozen. Average for 7 years: September 1 to October 12. Extremes: August 12, 1926, October 26, 1928. Next to the Merganser this is the duck most likely to be seen on the lake. Occasional migrant along the Lochsa but does not breed in this locality.

Spatula clypeata. Shoveller. Two records: October 26-27, 1928 (8); October 7-11, 1929 (6). No other records from this locality.

Dafila acuta tzitzihua. Pintail. One record: October 7, 1929; five, seen in company with Shovellers and Baldpates.

Nyroca valisineria. Canvasback. Occasional in October: October 5, 1926 (6); October 17-25, 1928, not uncommon. Generally in small groups and never more than a dozen together.

Nyroca affinis. Lesser Scaup Duck. One of the commonest species of ducks throughout the Lochsa drainage, but not often seen on the lakes. From October 16 to 28, 1928, they were seen on Fish Lake nearly every day, from singles and pairs up to a maximum of 16 at once. October 10, 1929, one individual seen. No other records for the lake.

Charitonetta albeola. Buffhead. One record only for the lake, October 16-17, 1928; one individual seen each day. Occasional along the Lochsa in late October and early November. Never more than three or four together.

Ardea herodias (herodias?). Great Blue Heron. Three records as follows: August 19, 1924 (1); September 26-27, 1927 (1); August 23-24, 1928 (1). Occasionally reported (late summer) from the lower Selway River.

Fulica americana. American Coot. One record from Fish Lake, October 17, 1928 (a single individual). Another seen October 19, 1927, on Long Lake, a smaller body of water some 8 or 10 miles from Fish Lake (altitude 6300 feet). A very common migrant along the lower Clearwater River but not noted from the mountains except for the two records given.

Capella delicata. Wilson Snipe. One record for the lake. Six were flushed in the Alpine Meadow at the head of the lake on September 16, 1924. Occasional individuals seen along the Lochsa in April, September and October.

Pisobia minutilla. Least Sandpiper. A single individual seen at the lake August 11, 1926, and again on the 16th. No other records for the region.

Totanus melanoleucus. Greater Yellow-legs. A pair seen July 30, 1928. Determined to be this species and not *T. flavipes* from precise measurements taken of tracks in the mud.

Tringa solitaria cinnamomea. Western Solitary Sandpiper. Not common, but generally a few seen at the lake each year. In five years the average first seen at the lake was July 31; last seen, August 20. Extremes: July 23, 1927, August 26, 1928. Also noted occasionally along the larger streams and on some of the smaller ponds in late July and during August.

Actitis macularia. Spotted Sandpiper. This is a very common summer resident along the Lochsa and Selway rivers as well as along many of the larger creeks in the region. Often noted in pairs and small family groups at Fish Lake in August and early September, but apparently does not breed at the lake.

Oxyechus vociferus vociferus. Killdeer. A very common bird along the lower Clearwater but noted in the mountains only as a rare straggler. One seen at Fish Lake on September 19, 1929, and again on September 25.

The following additional species, while not being recorded from Fish Lake, have been noted by me in the same mountainous region, that is, within the Lochsa drainage.

Larus californicus. California Gull. A lone individual was seen about the Lochsa Ranger Station on May 29, 30 and 31, 1923. It disappeared on the latter date but was reported from 20 miles down the river a few days later. Very tame.

Larus philadelphia. Bonaparte Gull. On October 28, 1925, following a severe storm which brought thousands of ducks and geese into the Lochsa Cañon, eight of these gulls were seen flying above the river and resting frequently on boulders along the bank.

Querquedula cyanoptera. Cinnamon Teal. A single individual was seen on the rocks of the river bank just above Lochsa Station, May 7, 1928. While apparently uninjured it was loth to fly and allowed approach to within ten feet.

Histrionicus histrionicus pacificus. Western Harlequin Duck. Occasional in May and June along the upper Lochsa. Usually in pairs and probably breeds here sparingly. Have seen none later than July 12.

Chen hyperborea hyperborea. Lesser Snow Goose. *Chen rossi*. Ross Goose. As no specimens were taken, which of the above species cannot be indisputably determined; but following the storm of October 27, 1925, thousands of Snow Geese were seen along the Lochsa Cañon from Pete King to Sherman Creek. These were mostly in detached companies of from 25 to 150. All had passed on by the evening of the 28th.

Branta canadensis canadensis. Canada Goose. *Branta canadensis hutchinsi*. Hutchins Goose. *Branta canadensis minima*. Cackling Goose.

At least one of the above, and quite likely all of them, are at times seen to pass over the Lochsa Cañon in migration, usually in April and November.

Olor columbianus. Whistling Swan. Following the heavy storm which brought the huge flocks of Snow Geese to the Lochsa Cañon, six swans were seen between the mouths of Fish and Sherman creeks on October 28, 1925. While no specimens were taken, the scarcity of *buccinator* makes it appear unlikely that the birds seen were of this species. Specimens examined in near-by localities during the same period all proved to be *columbianus*.

Botaurus lentiginosus. American Bittern. One noted on the Lochsa at the mouth of Weir Creek on September 6, 1923, and one at Long Lake August 22, 1929.

Referring to the Lochsa drainage as a whole, of the thirty-one species listed, but two, the American Merganser and the Spotted Sandpiper, can be called common breeders. Three others, the Eared Grebe, Green-winged Teal and Mallard, are common enough as migrants to be expected each year, while a total of four others might be termed irregularly common migrants though they are sometimes totally absent. These are the Loon, Baldpate, Lesser Scaup and Western Solitary Sandpiper. As for the other twenty-two species, they are all of unusual enough occurrence to mark as red-letter days those on which they are seen, and thus they contribute to the interest of a region which is naturally rich in land bird-life.

U. S. Forest Service, Avery, Idaho, September 21, 1931.

PRELIMINARY STUDIES OF WESTERN HERMIT THRUSHES

WITH FOUR ILLUSTRATIONS

By THOMAS T. McCABE and ELINOR B. McCABE

The following paper covers certain factors indicative of the present-day relationships of the Hermit Thrushes (species *Hylocichla guttata*) of the west. While studying a series of the birds collected near Barkerville, in central British Columbia, the authors became interested in the problem of these vaguely fluctuating forms, and ended by bringing together a rather large number of skins, of which some three hundred breeding specimens have been used in the present paper. No fresh or anatomical material has been available, no special studies of the factors of environment or habit have been attempted, and no material on the delimitation of winter ranges will be introduced at the present time. Other tasks prevent our following up the subject for the time being, but rather than distribute this collection fruitlessly, we ventured upon a revision of the group as far as possible on the basis of skins alone and these sadly limited in quantity and distribution. We hope soon to add further studies based on additional and fresh material which will fill up the geographic gaps and complete the mathematical analysis of variation in size and form, as well as a paper on migratory movements and winter ranges.

We believe that in the United States at least, a new race of bird should now be named only from its metropolis or optimum region and only as seems advisable after the most exhaustive revision of the whole species and comprehension of the relationships of the proposed sub-division. As the present paper hardly measures up to these requirements, we merely refer to such hitherto unremarked phases in geographic terms, without naming them.

CRITERIA

Color. The value of identifications of Hermit Thrushes can be gauged as in inverse proportion to the reliance on color. Almost invariably between *small* series from different ranges, especially if the lots are homogeneous as to locality, date, and collector, differences both in hue and value seem unquestionable. Only when large series are assembled which cover not only the whole season but (since undoubtedly birds from certain habitats show more wear than others) numerous localities, and only when these are watched and manipulated until we realize the full magic of light and the astonishing metamorphoses its modification can effect, does the hopelessly fugitive character of the color factor appear. The warmer grays and more neutral browns are at best, after the carnations, the most subtle and evasive of colors. In the case in point such foundation-hues are overlaid in fresh plumages by still more delicate and evanescent overtones of highly neutralized greens and reds. Add to these an unusual range of individual variation, incipient races of extreme proximity, the greatest tendency to wear we know of (we have some birds whose backs are covered with hair-like, nearly naked, feather-shafts), sensitive prismatic changes of color, including the disappearance of the reds of *nanus* and *faxonii*, with every degree and type of breakage, the power of the slightest film of grease, blood, or even water not only to turn a light olivaceous or reddish bird nearly black, but radically to modify such pattern as is present, substituting an effect of few and narrow in place of broad and numerous breast markings and obliterating the buffy band,—and we have some comprehension of the amount of error which has been perpetrated on museum labels and in check-lists as the result of color identifications. Color is of scant use, even in

large series, for separating the closely-allied intra-montane forms, that is, all those other than the eastern and western coastal races. Color characters in general are too variable and too vague to be susceptible of definite genetic analysis even if the races could be interbred in captivity. With the exception of a single race, color and size appear to be unlinked characters and tend to vary quite independently.

Size. The tarsus was measured from the second line of scutellar divisions above the unions of the toes to the center of the upper joint; the middle toe from the same division to the upper base of the claw; the bill from the anterior corner of the aperture of the nostril, without breaking the membrane, to the tip of the upper mandible; the tail from the basal bridge of integument between the deck pair to the end of the longest rectrix. All measurements were made with a fine slide-micrometer reading by dial to .10 mm. and by interpolation with fair accuracy to .01 mm. No measurements but our own have been used. Owing to the limited amount of statistical material most measurements have been tabulated in a somewhat undigested form as the means and simple extremes of races and localities. Standard deviation and its probable error have been computed and tabulated when the number of specimens justified some hope of their significance.

Sex. The only differences between the sexes which we have detected are quantitative. The following table shows the indices female over male for the five most abundantly represented races, and offers interesting comparisons with the graphs of the inter-racial variations. It is noticeable that while inter-racial variability is similar in wing, tail, and bill, between the sexes the wing and tail show a fairly constant differentiation in all races, with a suggestion of greater difference in *polionota*, while the bill-indices, considering the chance of error in so small a measurement, are amazingly close to 100%, or equality, in all races. Both inter-racially and intersexually middle-toe and tarsus vary vaguely, and hardly to a significant degree. One is left with the impression that wing, tail, and bill possess a certain constancy and significance, that they vary or remain constant purposefully, as though in response to a definite control.

Race	Wing	Tail	Tarsus	Middle toe	Bill
<i>guttata</i>.....	.961	.950	.991	.963	1.008
Southern B. C.....	.952	.960	.980	.983	.999
<i>nanus</i>.....	.964	.955	.970	.979	1.003
<i>sequoiensis</i>.....	.951	.963	.998	.982	1.023
<i>polionota</i>.....	.944	.930	.978	.991	.993

Males are used for the ensuing tabulations both because the series are larger and because the three male curves, in the graphs, are decidedly more uniform.

It must in general be borne in mind that our object has been to lay the foundation for studies such as might produce some evidence of the course of genetic development of the races of the Hermit Thrushes and explain the present composition of the species, not to reapportion names or provide guaranteed recognition-marks. For instance, we are interested in the evidence that factors, genetic or environmental, are or have been at work with discernible results on the birds which breed in the Coast and Cascade ranges of the United States, along the humid northwest coast, and in other parts of Alaska, and we believe these well worth analysis; but we do not for a moment suggest that individual specimens of *slevini*, *guttata*, or somewhat worn *nanus* can be distinguished individually, in a large number of cases, without reference to the geographic data.

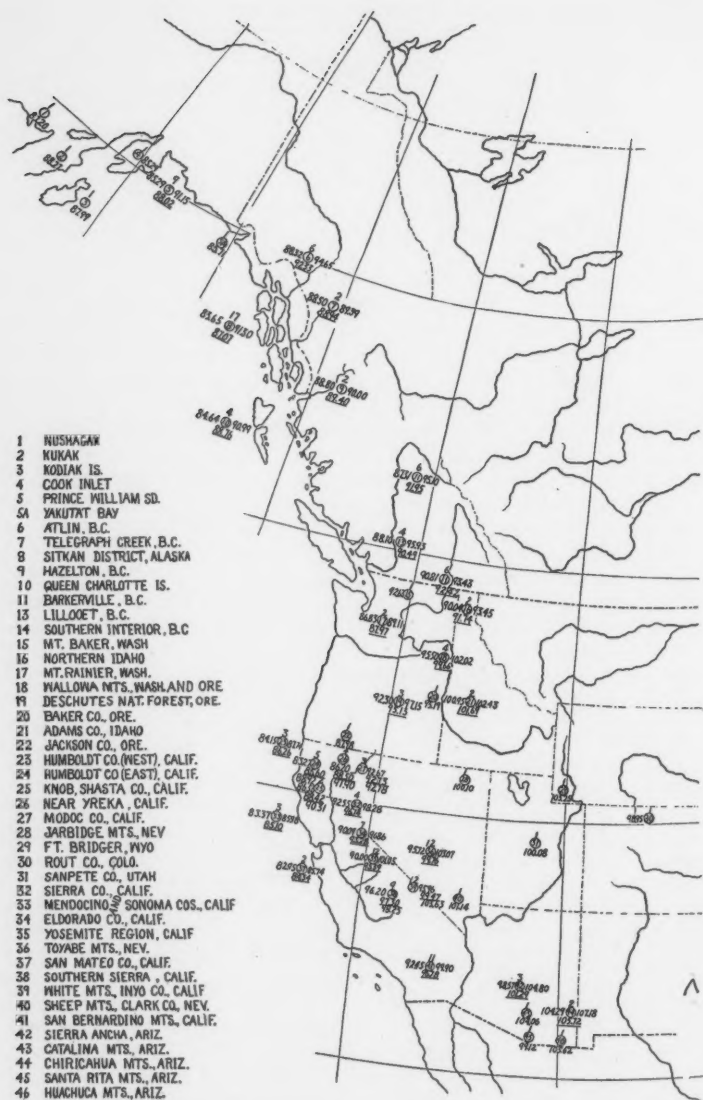


Fig. 4. WING MEASUREMENTS OF MALES OF *Hylocichla guttata* IN THE WEST. FIGURES WITHIN CIRCLES REFER TO THE LIST OF LOCALITIES. OTHER FIGURES GIVE THE NUMBERS OF SPECIMENS, THE MEANS (UNDERLINED) AND THE EXTREMES.

ALASKA AND THE NORTHERN INTERIOR

Hylocichla guttata guttata; *Hylocichla guttata nanus*; *Hylocichla guttata faxoni*. With the dwindling and disappearance of the coastal rain belt northwestward from the great Alaskan archipelago to and beyond Prince William Sound, the reddish tone of the coast birds tends to weaken (with no correlative variation which can be superficially detected), yielding to the somewhat more neutral average shade which prevails over the northern outposts of the species to and beyond the base of the Alaska Peninsula. Yet while the modification of the *average* color is distinct in large series, the degree of variability from red to gray remains striking. In our series of seven birds from beyond Prince William Sound there is a brilliantly red bird from Cook Inlet, and our only usable topotype from Kodiak Island would itself probably be referred to the red side of any rigid racial division. Inland and farther south, in spite of tight pinching, and even, in the valleys about Atlin, near-oblivation between the eastern and coastal forms, the same phase recurs in the mountains to north-central British Columbia.

As between this race and the most typical *nanus* of the coastal rain-forests, a considerable proportion of *fresh-plumaged* specimens, such as show the contrasting character to a marked degree, can be separated at sight. After mixing fifty skins, which represented all stages of the breeding season, 18 from Prince William Sound and 32 from the northern archipelagoes and adjacent mainland, we were able to pick out, in two attempts, seventy and seventy-five per cent of the total number correctly. The residue, though it chanced to contain many fresh plumages, seemed to be perfectly inseparable. It is possible that the perceptible distinctions might rise far higher, if not to one hundred per cent, between series of young birds passing or just passed from the juvenile into the immature plumage, and showing the latter, unbroken and unsullied, over the dorsal area. Of such specimens we have only three from the Sitkan district and two from Prince William Sound, but between these inadequate groups the difference in saturation is distinct.

Thus we may venture to contemplate, in southern Alaska and north-central British Columbia, two populations, differing slightly in color and almost imperceptibly in size, exhibiting perhaps the earliest visible results of radically differentiated environments, more or less isolated for long distances by the naked summits of the coast range, but intermingling in half a dozen great river valleys and half a hundred high timbered passes. Farther north and west occurs the disappearance of the factor of topographical isolation, with the environment reduced to something like a mean in the straggling margin of forest which extends for a thousand miles along the coast and islands of Alaska from Cross Sound to the shores of Bering Sea. Since the humid coast bird tends to show, in its red color, the positive modification, and since the coast forest itself is a most radically differentiated environment, it is natural, when we grope for causes, to link the two and to predict the gradual disappearance of the one with the other, that is, of the reduction of the red tone north of Sitka.

Of the more neutral phase, in its southern and inland range, east of the coast forests, we know only too little. Small series from Telegraph Creek on the upper Stikine and from Hazelton on the Skeena are indeed indistinguishable from those of Prince William Sound and beyond; but our simple picture of parallel interior and coastal races combining on the northern coast is complicated by the presence in the large valleys which surround Atlin, where such combination might be expected to begin, of a completely foreign quantitative factor in a majority of large birds, exceeding any so far considered by five per cent, and agreeing perfectly in size with the eastern form which we know to breed in the Mackenzie Valley and presume to

press westward, as it does in southern Alberta, to and into the mountains. In respect to this invasion Atlin must represent the very point of the spear, as no other known localities, either on the nearby coasts or southward in the upper valleys of the Stikine, where similar exposure to eastern invasion might be expected, tend, during the breeding season, toward this admirably concrete and measurable variation.

Before leaving the discussion of the northwestern races we must admit that while the differentiation of the coast bird depends on a single evidently incipient color-character, and the mere suggestion, in large series, of a reduction in size, yet within the southern limits of its range a sudden and isolated change in the size-character occurs which may indicate southerly connection with the small coastal race of the United States, which Grinnell has called *slevini*, and will probably be responsible for some future description of a new Vancouver Island race. Swarth (1912, p. 80) speaks of six juvenile birds taken on Vancouver Island as being far darker than juveniles from more northern points in the Sitkan district. We believe the single supersaturated bird which is responsible for this impression should be treated as a mutant or a rare extreme, and we do not find this distinction between other strictly comparable skins. On measurement, however, the six birds in question (all females) prove to be smaller by between four and five per cent than the females of any other group of *nanus* of like or unlike age, and so uniformly separable that the extremes overlap in only a single case, and then by only .03 mm. We have no fully adult birds of breeding date from Vancouver Island, and there is an almost complete lack of all ornithological material from the southern Canadian mainland coast. Two very small migrants taken at Portland, Oregon, on April 27, in 1908 and 1927, respectively, by S. G. Jewett and J. C. Braly, respectively, are almost certainly of this race.

It is an interesting fact which speaks for a mutative or genetic rather than directly environmental origin for these racial characters that such a variation should occur on Vancouver Island but not on the Queen Charlotte Islands, where so many common environmental factors recur in an enhanced degree.

SOUTHERN BRITISH COLUMBIA

As we follow southward in the northern interior into the watersheds of the Fraser and the Columbia and the closely adjacent parts of the northwestern states the curves which follow the relative variations of wing, bill, and tail do not keep to the average of the northern *guttata*, but rise to a new and higher level, which a detailed study of five scattered series proves to be consistent.

This becomes unmistakable in the series from the Barkerville region in the northeastern Cariboo district, in the great bend of the upper Fraser. Thence southward individual birds in the majority of cases may be identified not only by increased size but by a distinctly darker color, while the red variants, so common among the northern *guttata*, seem to have been eliminated, unless on contact with the eastern bird in the main ranges of the Rockies. Our usual lack of material from intermediate areas prevents an analysis of the southern termination or transition of this well-defined phase, but the racial map suggests a rather sharp break, across central Washington and Idaho, to the large race of the scattered ranges of the Great Basin.

In the discussion of the northern forms we saw that two races, coastal and interior, which we have every reason to believe of the closest possible genetic connection, differed slightly in color without differing materially in size. The present race, on the other hand, is the only example in the western field in which two well-developed characters, color and size, vary in apparent correlation, both appearing and

disappearing together, which constitutes an argument for the unity of the race as opposed to its interpretation as merely transitional in size between the birds of the north and south.

At first glance this apparent racial integrity is an embarrassing consideration to the student who wishes to analyze these races and regions by the methods of ecological correlation. It would be far easier to think in exclusively genetic terms of the propinquity of the large southern races. It is not easy to understand why a race which has persisted for some fifteen hundred miles in spite of intermittent susceptibility to neighboring genetic influences, and which, by means of a more and more elevated habitat can still occupy almost unchanged surroundings, should begin to vary without the intervention of any obvious geographic barrier.

Yet it is a striking fact that while at first, on the northern margin of the new racial area, the changes in environment appear to lie below and apart from the habitat of the Hermit Thrushes, none the less the northern limits of perceptible variation in the birds correspond closely with the first appearance, after the long monotony of the spruce, alpine-fir, and lodgepole-pine types, of a group of fundamentally new factors which foreshadow changes of continental importance. Such intrusive elements from the south and west are the far-reaching Douglas fir, which penetrates well into the chill humidity of the Cariboo and Selkirk mountains and becomes suddenly dominant on the benches and plateaus of the Fraser, the incipient grass-and-sagebrush, with true "bad-lands," alkali basins and even a widespread cactus, as far north as the junction of the Chilcotin River, and the first substantial appearance of the yellow-pine a few miles farther south. Farther still, in the southern interior of the province, with the progressive elevation of the forest belt, it seems unquestionable that yellow-pine, Douglas fir and western red cedar crowd more and more into the habitat of the thrushes, the average physical condition and appearance of the timber undergoes a change, and the increasing aridity of the lowlands breaks up the timbered zones into smaller and smaller "island" units which tend toward the conditions of the scattered ranges of the Great Basin.

It is from such more or less isolated interior mountain-masses that our series of the southern British Columbia race is derived. It is possible as we enter the great ranges of the Selkirks on the east, from which not a single bird is available, that modifications will be found, which might consist in decreased size (that is, more southern persistence of the unmodified *guttata* strain), but which will more probably show intergradation toward the eastern bird. When finally we cross the last intervening valley, where the headwaters of the Kootenay River are divided from those of the Columbia, and enter the Canadian Rockies proper, evidence of the influence of *faxoni* certainly appears, though our specimens illustrating such a condition are all from the eastern slopes, beyond the continental divide. These will probably be described by some future systematist as a new race. A series of seven birds which represent the eastern slopes of the Rockies on the latitude of the present interior race and localities northward in the mountains and northeastward into the transcontinental forest as far as Lake Athabasca are very uniform and close to the Atlantic seaboard phase, though with distinct modifications toward the intramontane races just discussed. These modifications are notably the loss of the warm browns in the flanks and most of the buffy chest band, with a perceptible general graying above. The extent of these tendencies eastward and the manner of their disappearance in the dark western race remain to be investigated as material accumulates. It is probably rather more than intuitive imagination to detect consanguinity with these intergrades in our northern Cariboo series, close as it is to the great passes at the headwaters

of the Fraser and the Athabasca, and in the small series from Telegraph Creek, as well as the prepotence of the eastern form in the Atlin series.

THE COAST AND CASCADE MOUNTAINS OF THE UNITED STATES

Hylocichla guttata selvini. In the whole field under discussion there is no more acute shortage of material than in the two northwestern states. With the exception of two worn birds from Mt. Rainier we have no evidence to what degree the *nanus* strain carries its color phase across the straits of Juan de Fuca or the lower Fraser. Our suspicion, somewhat reinforced by the two Rainier birds, is that it does so little or not at all. Among the most interesting questions still to be answered is whether the transition above the mouth of the Columbia between the northern and southern coast forest types can be correlated with a *nanus-slevini* transition.

The race *slevini*, described, as seems to be the fate of Hermit Thrushes, from the extremest limit of its breeding range in Monterey County, California, shows a thoroughly constant population northward along the California coast and into southern Oregon. Since we are ignorant of its northern termination, it requires present discussion only in so far as it appears, north of the great interior valleys of California and with the reestablishment of high altitude lines of communication between the coastal and Cascade mountains, to affect the size of the nearest large inland group, whether *sequoiensis* or *polionota*, among the extreme southern Cascades.

SIERRA NEVADA, GREAT BASIN, AND ROCKY MOUNTAINS

Hylocichla guttata sequoiensis; *Hylocichla guttata polionota*; *Hylocichla guttata auduboni*. Whether the scattered specimens from central and eastern Oregon are to be interpreted as intergradational between the coast and Great Basin forms, or as a northward extension of the Sierran strain, freed from the temporary contact with *slevini*, can only be determined by the discovery of new anatomical differentiating characters.

Even when the neighboring populations lie on opposite slopes of the narrow Owens Valley, the Sierran and Great Basin races remain distinct, and within the Great Basin specimens from six widely separated ranges in California, Nevada,

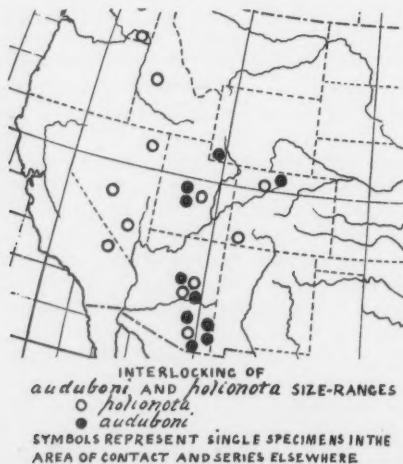


Fig. 5.

Idaho, and extreme southeastern Washington, show no tendency to vary. Thus Grinnell's *polionota*, described from the White Mountains of Inyo County in southeastern California, becomes the name of a widespread race. The clear demarcation in size of the races in question, along the eastern base of the Sierra Nevada, in spite of the close geographic proximity, is in sharp contrast to the baffling interpenetration which appears to exist farther east between *polionota* and the largest form of all, the rarely-collected *auduboni* of the southern Rockies.

A series of six adults, two males and four females, collected for William Brewster by M. Abbott Frazar between May 11 and June 8, 1887, in the Sierra de La Laguna in extreme southern Lower California, has been the subject of some comment in the literature of the species. The series, only five of which have wings and tail in a measurable condition, divides in a curious manner, as the two males are clear *polionota* and the three measurable females equally clear *auduboni*, which in itself suggests a migratory group rather than a breeding population. Of the five birds in question, three (one male and two females), were collected between May 25 and June 8, and should normally have been on their breeding ground. The two others, taken on May 11, are too early to require consideration. Since 1887, however, a considerable amount of collecting in Lower California, as well as Grinnell's (1928) ransacking of the ornithological records, has produced no further records of breeding Hermit Thrushes within the peninsula. We place particular reliance on the report of Mr. C. C. Lamb, who has worked the Sierra de la Laguna itself at the height of the breeding season. Pending further discoveries, therefore, we must content ourselves with speculation as to possibilities of delayed migration or abnormal conditions, and regard the series rather as an ornithological curiosity than as evidence of a resident population.

As to the status and distribution of *auduboni*, we can only suspend judgment and offer the scanty evidence available. A separate map (fig. 7) is added for this purpose, since it is necessary to use all material, of both sexes. As to the substantial existence of the race we can have little doubt, considering the easterly location of all our largest measurements, and the fact that their size is hardly approached in the several characteristic series of *polionota*. On the other hand there is less suggestion of intergradation than of a mixture of the two means in single populations, as in the Sierra Ancha. This is probably due, in such inadequate numbers, to chance failure to secure intermediate sizes.

The large male type, taken at Fort Bridger, Wyoming, on May 22, 1858, by C. Drexler, and kindly lent us by the National Museum, is quite indistinguishable from two males from the Chiricahua, one from the Huachuca, and one from the Catalina mountain ranges in southeastern Arizona. Between these geographic extremes, one female from Jackson County in northeastern Colorado and two from "Parley's Park," doubtless the present-day "Parley," in Juab County, Utah (Tintic Hills), taken by Ridgway in 1869, exceed the females of *polionota* by a corresponding amount. On the other hand a male from Rout County, Colorado (barely across the summits of the Park Range from the Jackson County bird just mentioned), a male from Sanpete County, Utah (just east of the Juab County bird), a female from Montezuma County in extreme southwestern Colorado, and one from the Santa Rita Mountains in Arizona, are of typical Great Basin dimensions. Furthermore, four birds from the Sierra Ancha, where intergradation might reasonably occur, divide two and two into distinct *auduboni* and *polionota* orders of magnitude! The only suggestion of intergradation we find is not in the area of contact, but in the maximum extremes of the large Toyabe Mountains series from central Nevada, and of the White Mountains series.

All three of these large southern races are light in color value; but our series of *sequoiensis* and *auduboni* are far more variable between a more neutral and a faintly reddish hue (though never to the *guttata* degree) than *polionota*, which is distinctly more consistent and more neutral, and recalls in both respects the unnamed race of south-central British Columbia.

RELATIONSHIPS OF RACES

When we try to detect such evidence of consanguinity between these races as might shadow forth a genetic theory of their relationships, the most confusing factor is the occurrence of the reddish hue in populations geographically and metrically so widely sundered. The two reds in question differ markedly, that of the northwest coast being rather dark and relatively neutral, that of the east light and relatively intense; but in so far as our chromatic sense can isolate it, the essential character of the basic red pigment does not change. Aside from the faint and very fugitive greenish cast which is present in the fresh body plumage of several forms, we may say that in color Hermit Thrushes vary in two principal ways: First, in hue, according to the concentration of the red pigment. Second, in value, according to the concentration of the gray or black pigment. Now since *nanus* is surrounded by and resembles in size three small and relatively dark forms, and since *faxoni* tends to group itself geographically and according to size with three large and relatively light forms, it seems natural to suggest that the difference in the two reds depends upon the amount of gray with which they are mixed, or upon the equilibrium of the two colors. Further, if, mindful of the probably more primitive character of the universal gray, and of the probably more conservative character of skeletal and size changes, we consider the red variations as late and superficial, the races fall at once into two highly satisfactory minor groups—the Pacific group, with its four small, dark, phases, three of which are so faintly discernible, and the central group, with its four large, light-colored forms, all more trenchantly divided. Each contains a single form which tends to a certain red hue, in one case faintly incipient and presumably imposed upon the darker gray, in the other case strongly developed and imposed upon the lighter gray.

This group division helps us to some understanding of the relationships and probable history of the races. The groups should not be confused with the "race-groups" (*Rassenkreise* or *Formenkreise*) of Rensch, Kleinschmidt and Hartert, which, if applied to the present case, would certainly include the whole species, and might be found to exceed its limits.

The weakness of a categorical system lies in the assumption of equality among the categories. In the present case neither the races nor the groups should be considered equal as to age or degree of divergence. The evidence suggests that the Pacific group as a whole is perhaps more nearly equivalent in these respects to the individual races of the continental group.

It would be futile on the basis of present knowledge to speculate further upon racial origins. It may, however, be worth while to call attention to the strikingly regular increase in size from northwest to southeast, and the possibilities of interpretation which this may offer in connection with a detailed study of the genetic relationships of *Hylocichla* with *Catharus*, *Erithacus*, *Ianthia*, and possibly other genera.

STATISTICAL TREATMENT

A large part of the material used in this paper is either barely sufficient or definitely insufficient to warrant the application of elaborate statistical treatment.

The following table of standard deviations, applied to the three most important measurements of the six most numerous racial series, gives a fairly definite idea of the degree of variation found in this material. The mean values are give in table I.

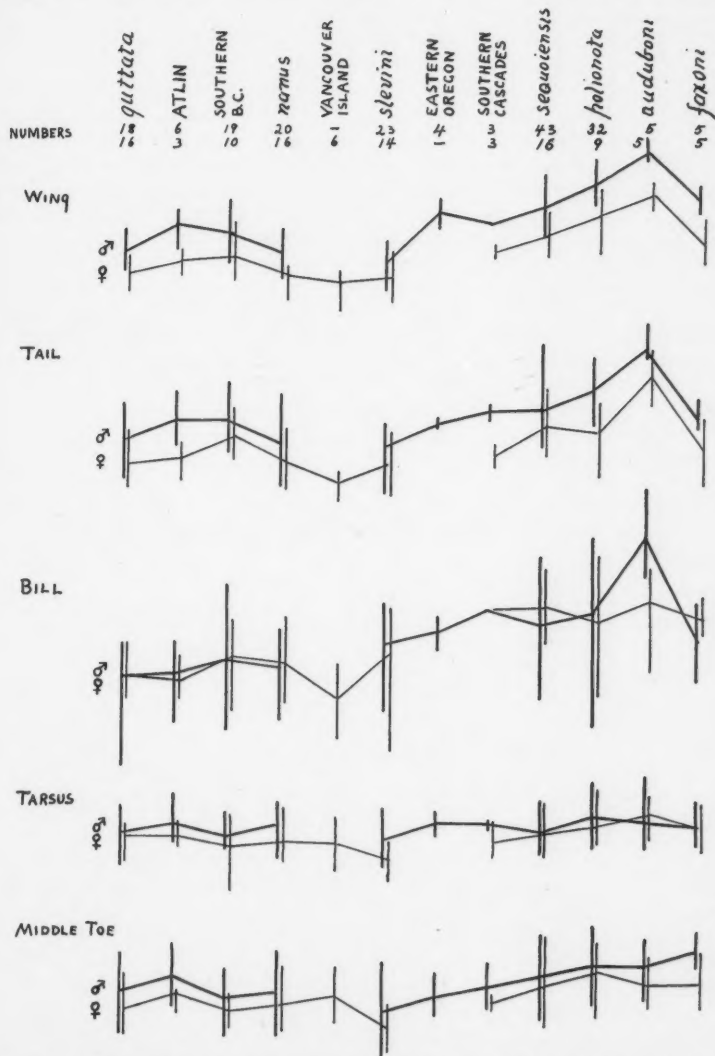


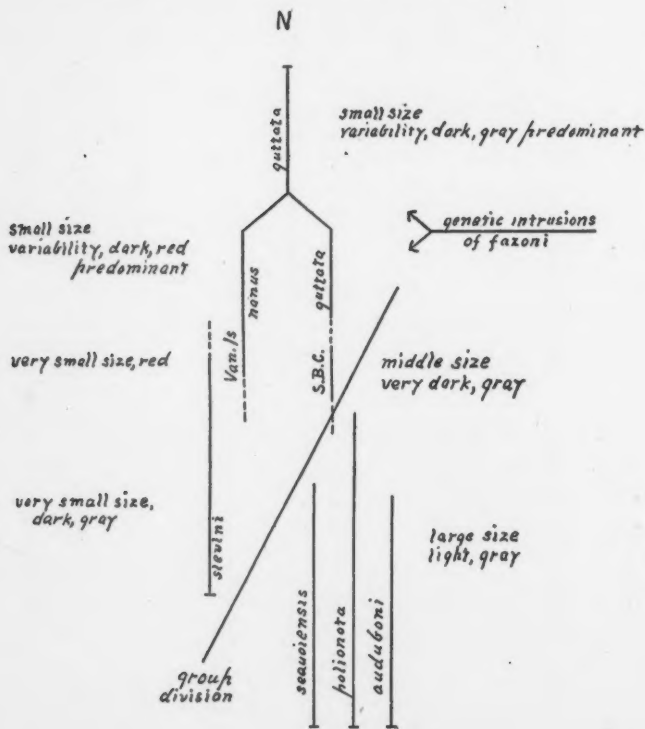
Fig. 6. GEOGRAPHIC AND INDIVIDUAL VARIATION IN MALES AND FEMALES OF *Hylocichla guttata*. CURVES FOLLOW THE VARIATIONS (PERCENT) FROM THE MEANS OF *guttata* OF THE MEANS OF OTHER GROUPS. VERTICAL LINES CONNECT THE EXTREMES OF EACH GROUP, WHICH ARE SHOWN AS PERCENT VARIATIONS FROM THE MEAN OF THE GROUP.

Race	Number	Wing	Tail	Bill
<i>guttata</i>	18	3.04 ± .342	3.20 ± .384	1.67 ± .130
Southern B. C.	19	4.40 ± .481	4.03 ± .480	1.04 ± .113
<i>nanus</i>	20	3.08 ± .328	4.09 ± .505	.65 ± .069
<i>slevini</i>	23	3.04 ± .308	3.34 ± .350	1.76 ± .178
<i>sequoiensis</i>	43	3.22 ± .284	6.14 ± .451	1.46 ± .107
<i>polionota</i>	32	3.52 ± .301	5.76 ± .519	1.19 ± .099

THE SIGNIFICANCE OF VARIATION

When these races have been analyzed for significant differences, especially those of size, the question arises of the interpretation of the latter as determinants of the essential character of the bird and therefore of their possible adaptive history or relationship to environment or migratory habits. Therein lies the descriptive weakness of appendicular measurements unsubstantiated by fresh or skeletal material. While we can show that the wings of the Hermit Thrushes of the southern Rocky Mountains and of those of the Great Basin exceed the races of the northwest by about 17 percent and about 12 percent respectively, and the tails by about 15 percent and 8 percent respectively, we still cannot state concretely whether the bird is consistently larger or whether it merely possesses longer wings, tail, and bill. The fact that the corresponding graphs of the tarsus and middle toe are flat may indicate stability

DIAGRAM OF DIFFERENTIATING CHARACTERS



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Fig. 7.

of essential size, or, on the contrary, that while the bird as a whole increases, these elements undergo relative retrogression. Since material for a full geometric analysis is lacking, there remains only one resource, that of mass. Of weights of specimens, thanks to the careful field technique of the Museum of Vertebrate Zoology, we have a fair number for certain races and seasons. Unfortunately, however, our total ignorance of the laws which govern weight, construction, type of flight and wing area, prevents the ensuing correlations from having much significance.

In order to develop some conception of the nature and reliability of the unfamiliar material we may start with a preliminary examination of the only large series of weights available, of California-taken October, November, and December birds of the *guttata-nanus* order of magnitude, of which we have 45 weights, distributed as follows. Weights are in grams.

Age and Sex	Number	Minimum	Mean	Maximum
ad. ♂	20	22.30	25.02	28.50
ad. ♀	12	19.90	23.42	25.50
im. ♂	8	22.20	24.77	27.00
im. ♀	5	22.50	23.62	25.50

When arranged in order of date, these weights show no progressive change.

From the amount of material available we are restricted to gross comparisons and need anticipate no difficulties from possible differences in weight between birds of the *guttata* and *nanus* breeding areas or even from the few possible Vancouver Island or southern coastal (*slevini*) birds which may be included. The table just given represents fairly enough the small western and northwestern races, and its purpose is to indicate roughly the degree of individual variability and the degree of variation between sexes and between adults and immatures, and to substantiate, with due allowance for variations under the stress of breeding conditions, the following tables of less significant numbers of breeding male birds.

Place	Number	Minimum	Mean	Maximum
Telegraph Creek, B. C.....	2	22.70	23.90	25.10
Humboldt Co., Calif.....	3	21.50	23.43	26.30
Central Sierra Nevada.....	4	24.50	25.77	26.70
Great Basin (Toiyabe Mts.) ad. 9		24.50	27.80	30.80
Great Basin (White Mts.)..jv. 4		29.10	30.20	30.80

The outstanding single item of reliable information to be derived from these tables is that the Great Basin race, which exceeds the small races in wing-length by about 12 percent exceeds them in weight by between 10 and 15 percent. Of this (since the weight of the whole wing from the distal end of the humerus is only about 2 percent of the total weight), the actual increment to the wings is a negligible fraction. Obviously the two variations are differential, as considering the relation between the mass and diameter of any roughly spherical object, a directly proportional increase in body size would be reflected in a far greater increase in body weight. We dare not, however, conclude from this that the change is really one of relative *utility* of wing or functional modification; because we know too little of the laws which control the factors involved. It is quite conceivable, for instance, that for a given type of flight [such, for instance, as those established by Böker (1930) in his analysis of flight-groups and flight-construction], there exists a relationship between weight and alar surface in which the latter increases either at a rapidly magnified or rapidly reduced ratio to the former. A rapidly magnified ratio would be consistent with the obvious fact that rapid and highly controlled flight of the passerine type is achieved by no large bird, and deteriorates rapidly with increased size even among the Passeriformes.

TABLE I. MEASUREMENTS
SHOWING RACIAL MEANS AND EXTREMES, IN MILLIMETERS

MALES														
Place	Number	Wing Min.	Wing Max.	Min.	Tail Min.	Max.	Tarsus Min.	Max.	Min.	Middle toe Mean	Max.	Min.	Bill Mean	Max.
Alaska Peninsula.....	3	85.29	86.22	88.27	63.42	66.07	67.65	27.61	28.33	28.76	16.59	17.12	8.48	9.13
Kodiak Island.....	1	87.99			69.12			30.06			16.00		9.13	
Prince William Sound.....	9	85.51	88.02	91.65	65.20	68.32	72.45	27.15	28.77	29.64	16.42	17.77	7.40	9.40
Yakutat.....	1	85.71			69.43			29.80			16.73		9.54	
Telegraph Creek, B. C.....	2	88.50	88.94	89.39	69.38	69.62	69.87	28.00	28.40	28.80	16.22	16.64	8.50	9.10
Hazelton, B. C.....	2	88.80	89.40	90.00	67.18	67.89	68.60	27.62	28.66	29.70	17.07	17.30	9.20	9.40
<i>guttata</i>	18	87.62			68.11			28.74			16.43		8.87	
Atlin, B. C.....	6	88.32	92.33	94.65	67.30	70.32	74.00	28.33	29.39	31.00	16.30	17.16	8.04	9.40
Barkerville, B. C.....	6	87.31	91.95	95.40	66.43	69.69	75.23	27.73	28.58	29.54	15.80	16.57	17.16	9.20
Lillooet, B. C.....	4	88.10	90.49	95.93	67.40	71.08	75.84	28.10	29.10	29.92	16.18	16.40	8.70	10.00
Southern interior of B. C.....	6	90.81	92.42	93.43	68.70	72.02	73.55	27.10	28.88	30.62	15.36	16.03	8.35	9.16
Mt. Baker, Washington.....	1	92.63			—	—	—	—	—	—	—	—	9.30	10.00
Northern Idaho.....	2	90.04	91.74	93.45	68.30	69.05	69.80	26.30	27.50	28.70	15.73	15.91	7.92	8.67
Southern B. C.....	19	91.75			70.57			28.62			16.18		9.13	
Sitka district.....	17	83.65	87.07	91.30	64.96	68.08	73.90	27.50	29.19	30.00	15.10	16.39	17.74	8.99
Queen Charlotte Islands.....	4	84.64	88.76	90.99	62.38	65.41	71.75	28.15	29.02	29.78	16.84	17.49	8.70	9.31
<i>napus</i>	20	87.20			67.32			29.15			16.46		9.00	
Mt. Rainier, Washington.....	2	86.83	87.97	89.11	66.20	67.95	69.70	27.92	28.37	28.83	16.23	16.73	9.55	9.53
Jackson Co., Oregon.....	1	87.98			66.85			27.58			16.03		9.50	
Near Yreka, California.....	4	86.20	88.50	91.90	65.89	69.94	72.43	27.80	28.18	28.75	15.20	16.93	9.23	10.15
Humboldt Co., Calif. (fog belt).....	3	84.15	86.26	87.74	66.70	68.26	69.30	27.73	28.22	29.20	15.60	15.69	15.84	9.42
Humboldt Co., Calif. (interior).....	5	83.27	85.60	88.92	64.42	65.94	69.26	28.32	29.01	29.33	15.00	16.75	16.70	9.85
Near Knob, Shasta Co., Calif.....	2	86.53	88.42	90.31	69.10	69.20	69.31	28.10	28.12	28.14	14.99	15.15	15.32	9.93
Central California coast.....	6	82.95	84.80	85.94	62.15	65.78	67.82	26.32	27.74	29.77	14.52	15.18	16.23	9.27
<i>alberti</i>	23	86.61			67.76			28.24			15.67		9.50	

Place	Number	Wing	Max.	Min.	Tail	Max.	Min.	Tarsus	Max.	Min.	Middle toe	Max.	Min.	Bill	Max.
East central Oregon.....	4	92.30	95.35	97.15	69.12	69.79	70.10	28.93	29.52	30.24	15.77	16.29	16.88	9.30	9.76
Southern Cascades.....	3	92.67	92.73	92.78	70.10	71.58	72.91	28.75	28.89	29.13	15.80	16.44	17.21	10.10	10.10
Northern Sierra Nevada.....	11	90.09	94.32	98.28	62.56	70.96	75.61	27.18	29.03	30.41	15.72	16.65	18.10	8.81	9.86
Central Sierra Nevada.....	12	90.00	95.39	101.05	67.80	71.56	74.97	27.27	28.39	30.40	16.00	16.92	18.20	8.40	9.88
Southern Sierra Nevada.....	9	96.30	97.30	98.25	70.70	72.95	75.89	27.93	28.72	29.99	16.21	16.83	17.65	8.30	9.35
San Bernardino Mts.....	11	92.45	96.78	99.90	65.86	72.39	77.35	27.12	28.82	29.68	15.58	16.72	18.02	9.00	9.87
<i>sequoensis</i>	43	95.94			71.88			28.73			16.78			9.76	
Wallowa Mts., Wash. and Ore.....	4	95.50	99.66	102.02	71.94	74.00	76.50	28.17	29.57	31.48	16.00	17.14	18.10	9.80	10.23
Smith Mts., Adams Co., Idaho.....	2	100.95	101.69	102.43	78.42	78.71	79.00	29.13	29.56	30.00	16.52	16.98	17.44	9.78	10.34
Jarbridge Mts., NE Nevada.....	1	100.10			76.48			29.64			16.62			9.38	
Torrey Mts., Nevada.....	12	95.72	99.76	103.07	69.38	73.03	76.32	28.30	29.95	31.80	16.40	17.43	18.31	9.50	10.34
Clark Co., Nevada.....	1	101.14			72.86			29.88			18.20			10.05	
White Mountains, California.....	12	95.96	99.47	103.63	70.10	74.03	78.74	29.00	29.63	30.61	15.82	17.06	18.25	7.76	9.04
<i>pelsonota</i>	32	99.75			74.00			29.77			17.24			9.78	
Rout Co., Colorado.....	1	98.95			72.57			29.36			17.40			10.39	
Sanpete Co., Utah.....	1	100.08			70.74			28.35			17.02			10.78	
Sierra Ancha, Arizona.....	3	98.57	101.29	104.80	73.60	75.39	78.70	27.18	28.41	29.65	16.20	16.84	17.82	9.80	10.25
Santa Rita Mts., Arizona.....	1	99.12			72.28			31.60			18.20			10.10	
Fort Bridger, Wyoming.....	1	106.25			78.08			32.07			17.65			11.00	
Chiricahua Mts., Arizona.....	2	104.29	105.72	107.18	78.88	86.55	82.42	28.81	29.35	29.70	17.10	17.50	17.90	11.63	11.93
Huachuca Mts., Arizona.....	1	105.62			78.75			28.35			17.20			10.58	
Catalina Mts., Arizona.....	1	104.06			79.10			29.50			17.45			10.52	
<i>auduboni</i>	5	105.23			79.45			29.69			17.46			11.19	

FEMALES

<i>guthata</i>	16	81.80	84.09	86.92	62.00	64.72	68.76	27.31	28.52	29.23	15.20	15.88	16.90	8.50	8.88	9.40
Atlin.....	3	84.21	86.10	87.99	63.00	65.10	67.20	28.00	28.45	29.12	15.77	16.31	16.75	8.50	8.75	9.15
Southern B. C.	10	83.60	87.34	93.45	64.85	67.78	71.66	25.42	28.06	29.88	14.63	15.90	16.88	8.20	9.12	9.60
<i>nanus</i>	16	80.43	80.69	86.30	61.31	64.29	68.50	27.30	28.26	30.10	15.31	16.11	17.10	8.30	9.03	9.78
Vancouver Island.....	6	79.33	80.69	82.35	60.50	62.38	65.88	26.73	28.19	29.20	15.43	16.27	17.10	7.81	8.38	8.97
Warner Mts., Calif.....	3	84.95	85.62	86.48	64.18	65.64	67.10	27.52	28.22	29.30	15.77	16.03	16.30	10.00	10.13	10.40
<i>slevini</i>	14	79.15	83.10	85.05	60.88	64.41	66.84	26.20	27.29	29.50	14.67	15.49	16.17	8.60	9.24	10.00
<i>sequoensis</i>	16	87.09	91.17	95.46	66.06	69.24	73.97	27.45	28.70	30.10	15.35	16.48	18.09	9.34	9.98	10.70
<i>potionota</i>	9	91.49	94.21	98.80	67.52	68.68	70.30	28.10	29.16	31.05	16.20	17.04	17.80	8.90	9.78	10.98
<i>auduboni</i>	5	96.31	98.69	101.36	70.37	74.01	78.15	28.10	29.55	30.54	16.95	17.00	17.95	8.71	10.09	10.64
<i>fazoni</i>	5	85.56	88.69	92.57	61.70	66.26	70.40	27.45	28.50	30.28	16.42	17.08	18.10	9.50	9.76	10.17

One resource remains which is probably capable of indicating a definite relationship, if such exists, between wing and weight. In the winter males and females of the races which breed in the northwest we have two groups of different sizes and weights but of like physical condition, in winter at least, and of like construction as far as our measurements can reveal it—of identical migratory habit, and identical environment at all seasons. Unequal division of labor during the period of laying and brooding are the only apparent differences in habits. In other words, we have two birds of different sizes in which we may believe that flight-power and flight-adaptation are identical. If therefore there exists anything like a constantly variable relationship between weight and wing-length in Hermit Thrushes, we might expect the same degree of relative differentiation to hold for a third form (in this case *polionota*), if the third form is identical as to power of flight. In other words we may set up the following proportion:

$$\frac{\text{Wing. Pac. Group } \delta}{\text{Wing. Pac. Group } \varnothing} : \frac{\text{Weight. Pac. Group } \delta}{\text{Weight. Pac. Group } \varnothing} :: \frac{\text{Wing. Pac. Group } \delta}{\text{Wing. polionota } \delta} : x$$

That is: 1.040 : 1.068 :: .873 : x ; or, x equals .890. X, considered for the moment as the unknown, represents on this basis the ideal ratio of weights between the males of the northwestern races and of the Great Basin race, and works out as .890, or a difference of 11 percent.

In point of fact the actual index of the means of our weights works out as .900, if we use the large winter series of the Pacific group, and as .850 if we use the five breeding birds of those races. Undoubtedly the former figure is too large owing to winter condition and the smaller too small owing to preponderance of *slevini*, so that the results are strikingly close and suggest, within the limitations of such material, that a rather constant relationship of wing-length and weight exists between the two races in question.

Sincere thanks are due to the following individuals and institutions for loans of specimens or access to collections: The California Academy of Sciences; The Canadian National Museum; The Colorado Museum of Natural History; Mr. Donald R. Dickey, of Pasadena; Mr. Ralph Ellis, Jr., of Berkeley, California; Mr. S. G. Jewett and Mr. I. N. Gabrielson, both of Portland, Oregon; the late J. Eugene Law, Altadena, California; Mr. J. A. Munro, Okanagan Landing, British Columbia; The Museum of Comparative Zoology, Cambridge, Massachusetts; The Museum of History, Science, and Art, Los Angeles; The Museum of Vertebrate Zoology, Berkeley, California; The Provincial Museum, Victoria, British Columbia; The State Museum, Seattle, Washington; The United States Bureau of Biological Survey; The United States National Museum; Mr. George Willett, of Los Angeles.

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NOTES ON A COLLECTION OF BIRDS FROM
MANSEL ISLAND, HUDSON BAYBy GEORGE MIKSCH SUTTON¹

During the summer of 1929, while on my way to Southampton Island, I became acquainted with Mr. Albert T. Swaffield, one of my fellow passengers on board the *Nascopie*, who had been detailed by the Hudson's Bay Company to establish a fur-trading post on Mancel Island. I knew that but little was known of the bird-life of this island, and I was eager to learn whether the same species occurred there as on Southampton, so hastened to ask Mr. Swaffield to save for me, if possible, such specimens or pieces of specimens as might come into his hands from the Eskimos, or to preserve in some way parts of such birds as he himself might kill as food. I knew that he would be exceedingly busy in building his winter quarters, in traveling about on the island, and in trading with the natives, so I did not request him to prepare the specimens carefully nor to keep complete data.

The material which Mr. Swaffield collected reached me in mid-summer of 1930, just as I was leaving Southampton. Though the rough skins and fragments were not in good condition they were, nevertheless, readily identifiable and most of them were accompanied by a label with a statement of the date of capture. I brought the collection back with me so as to be able to make the necessary comparisons, and have prepared the following list in the belief that it may be of interest.

Mansel Island lies just south of the mouth of Hudson Bay, about midway between Coats Island (the island just south of Southampton) and the region of Cape Wolstenholme. It was discovered in 1613 by Captain (later Sir) Thomas Button. It was supposed at the time to be a group of islands, and the name "Mancel's Islands" appeared on contemporary charts. Later the island was referred to as "Mansfield's Islands" (John Barrow, 'A Chronological History of the Voyages into the Arctic Regions', 1818, p. 200). It was named by Button in honor of Vice-Admiral Sir Robert Mancel, whose niece Button married (James White, "Place-Names in Northern Canada", Report Geographic Board of Canada, 1910, p. 402).

I have never been on Mancel Island; but I remember noting it from one of the Revillon Frères schooners during the late summer of 1926 as an exceedingly flat, dull-gray piece of land.

Gavia stellata. Red-throated Loon. Four specimens were secured. One, taken October 21, 1929, may have been a cripple, since the date is very late. Two were secured on May 24, 1930. A pair of wings were taken from an immature specimen secured in the fall of 1929. This species probably nests.

Cygnus columbianus. Whistling Swan. An adult was secured on June 4, 1930. The silken plumage of the crown of this specimen is tipped with rich golden brown. The yellow spot at the base of the upper mandible is very small but distinct. Probably nests.

Branta canadensis hutchinsi. Hutchins Goose. One was secured during the summer of 1930. Only the wings were preserved. These measure 387 mm. Probably nests.

Branta bernicla hrota. American Brant. Wings of a brant taken on September 15, 1929, are probably referable to this species, though there is no way of distinguishing with certainty the wings of *bernicla* and *nigricans* so far as I have been able to determine. Probably nests.

¹ The author wishes to express his thanks to Dr. A. A. Allen, of Ithaca, New York, and to Drs. Harry C. Oberholser and Herbert Friedmann, of Washington, D. C., for assistance in the preparation of this paper.

Chen hyperborea hyperborea. Lesser Snow Goose. The wing of a white goose secured on June 3, 1930, is included in the collection. This wing measures 399 mm. Probably nests.

Clangula hyemalis. Old-squaw. An adult male and female were secured on September 6, 1929. This species probably nests along the coastal lakes.

Somateria mollissima borealis. Northern Eider. An adult male in breeding plumage was taken on May 20, 1930. The lateral frontal processes at the base of the upper mandible are not, perhaps, as narrow and pointed as in typical specimens of *borealis*, but they are decidedly too narrow and pointed for *dresseri*. The wings of an adult female eider, probably also of this form, and secured on September 21, 1929, were preserved. This species probably nests on little islands in the larger lakes, or on rocky islets in the salt water.

Somateria spectabilis. King Eider. An adult male was taken on June 5, 1930. Probably nests.

Pluvialis dominica dominica. American Golden Plover. A specimen in immature plumage was secured during the fall of 1929. Probably nests.

Squatarola squatarola. Black-bellied Plover. An adult bird was secured on May 19, 1930, and an immature during the fall of 1929. Probably nests.

Arenaria interpres morinella. Ruddy Turnstone. An immature specimen was taken on September 10, 1929, and an adult male in full breeding plumage on June 8, 1930. Probably nests.

Phaeopus hudsonicus. Hudsonian Curlew. A specimen, probably young, and in fresh winter plumage, was taken during the fall of 1929.

Calidris canutus rufus. American Knot. A handsome adult in almost perfect summer plumage was taken on June 11, 1930. There were mere traces of winter plumage on the rump, lesser and greater wing coverts, and belly. The bill and wing agree with those of female specimens in length.

Arquatella maritima. Purple Sandpiper. Parts of an adult in breeding plumage are included in the collection, but these fragments are not accompanied by a date. Measurements of the bill are those of a male specimen.

Pisobia fuscicollis. White-rumped Sandpiper. An adult in breeding plumage was secured in mid-summer of 1930. Probably nests.

Phalaropus fulicarius. Red Phalarope. An adult female in full breeding plumage was taken on June 10, 1930. Probably nests.

Stercorarius parasiticus. Parasitic Jaeger. An adult of the light phase was taken on September 30, 1929. Probably nests. It is surprising that no other jaegers are to be found in the collection, since all three species are known to occur together in this general region.

Larus argentatus smithsonianus. Herring Gull. An adult in summer plumage was brought in to Mr. Swaffield in mid-winter. The actual date of capture is not known. Probably nests.

Pagophila alba. Ivory Gull. A specimen in the handsomely marked plumage of the immature bird was taken on November 25, 1929.

Xema sabini. Sabine Gull. An adult was secured on June 2, 1930. This species probably nests on islands in the lakes. It is surprising that no Arctic Terns, *Sterna paradisaea*, were included in the collection, since this tern and the Sabine Gull are frequently found together in this part of Hudson's Bay.

Uria lomvia lomvia. Brünnich Murre. Wings were preserved from specimens secured on September 6 and 16, 1929. The faded appearance of the tips of the primaries suggests that the birds may not yet have completed their post-nuptial molt. This species is known to nest abundantly along the northeastern end of Coats Island and at Cape Wolstenholme.

Cephus grylle mandti. Mandt Guillemot. One specimen, in handsome winter plumage, was taken on November 25, 1929. Judging from the immaculacy of the white patch in the black wing and from the redness of the feet, I take it to be a full adult. The plumage of the head, neck, and underparts is largely clear white. If loose boulders are to be found on promontories and off-shore islands about Mansel this species probably nests; and it very likely winters in whatever open water is to be found about the island.

Nyctea nyctea. Snowy Owl. Several specimens were secured during the year. One taken on November 4, 1929, was heavily barred. Probably nests.

Hirundo erythrogaster. Barn Swallow. It is indeed interesting that in a single year's collecting at random such a straggler as this should be taken. One was secured on June 14, 1930. The tail of this specimen is noticeably short, measuring only 68 mm. It appears to be an adult. I sent this bird to Dr. Harry C. Oberholser of the Biological Survey, Washington, D. C., for final identification. Dr. Oberholser in his letter says: "The female nearly always has a shorter tail than the male and apparently your specimen is one of the former sex."

Cornell University, Ithaca, New York, November 13, 1931.

FROM FIELD AND STUDY

A Bat-eating Sparrow Hawk.—In the depths of the Grand Cañon of the Colorado, a Desert Sparrow Hawk (*Falco sparverius phalaena*) was seen to pursue, capture, and devour a small bat. This occurred at 4:35 p. m., October 30, 1930, in the inner cañon of Hermit Creek, about sixty feet above the stream bed and at a point directly below Hermit Camp, elevation 3000 feet. Mr. Ben H. Thompson also witnessed the incident.

The little inner gorge was in shadows, though the sun still brightened the plateau above. The hawk flew low over the edge of the plateau, and while under observation it was seen to be pursuing a small fluttering object which I instantly took to be a bird. My immediate thought was to make sure that it was a sparrow hawk thus engaged in so unorthodox a pursuit. My field glasses were trained on the hawk and followed it while it dived at its prey, which proved to be a small bat. It dived repeatedly, not following the bat about, but striking at it and then gaining a little height before bearing down again. Once, however, it followed the bat into the overhanging recess toward which it was retreating and chased it out again. At about the seventh attempt, the little bat was caught in its talons and carried to the top of the ledge over the recess. The bird remained there for about two minutes, picked at its prize a couple of times and then flew to a rock on the plateau above. In flight, the sparrow hawk was silhouetted against the evening sky and its extended talons could plainly be seen clutching the body of the little bat whose wings appeared to be folded.

On the rock the sparrow hawk proceeded to consume its prey. Once Mr. Thompson saw three or four inches of entrails dangling from its beak. The process of eating took about three to five minutes. A little later the sparrow hawk opened its mouth wide and disgorged a small piece of something, we could not tell what. When the chase occurred it was still daylight, but by now it was beginning to get dusky. The sparrow hawk flew over the little gorge once more but did not hesitate, and passed out of sight over the hill. The bluish wings and red tail with strongly marked black terminal band showed it to be a male.

Because the bat appeared to be of a uniformly silver gray color and of such very small size, I believe that it was the Canyon Bat (*Pipistrellus hesperus hesperus*), rather than the Little Pallid Bat which is also found in the Grand Cañon. However, this cannot be asserted with any degree of finality.

This occurrence is noted in detail because the known natural enemies of bats are few.—GEORGE M. WRIGHT, *Berkeley, California, October 12, 1931.*

Bird-eating Ground Squirrels.—I do not know in just what year I made the following observation, probably 1903, but it does not matter. I was doing a little collecting on the plains just northeast of Colorado Springs that spring, and on the way to my traps walked along a road bordered by uncultivated ground, and beside which was a telephone line with several wires. Pale striped ground squirrels (*Citellus tridecemlineatus pallidus*) lived in holes on this land and I often noticed feathers, usually of Horned Larks (*Otocoris alpestris leucolaema*), near the holes and wondered if the squirrels had caught the birds and how.

One day the conundrum was answered for me. As I walked along the road a small flock of Horned Larks flew up; one struck a wire and fluttered down to the ground near some of the burrows. I walked over to it and found it dead. It seemed to me that this explained how the squirrels obtained their fresh meat, and certainly no blame could be laid on them for taking advantage of their opportunities. I was pleased to find that the squirrels had probably not been stalking and catching the birds themselves, though they may have killed wounded birds.—EDWARD R. WARREN, 1511 Wood Avenue, Colorado Springs, Colorado, October 26, 1931.

Requiem for the White-tailed Kites of Santa Clara Valley.—From observations made in 1928 (Condor, xxxii, 1930, pp. 221-239) the writer estimated that there were possibly sixteen to twenty White-tailed Kites (*Elanus leucurus majusculus*) in the Santa Clara Valley, located in four areas. This day (October 30, 1931) there cannot be more than two or three, and all too possibly none! From the four areas noted above, Kites have definitely gone from two, their presence in the third is improbable, and in the fourth there cannot be more than two and even these at this moment may no longer exist.

Field work from the State College at San Jose carries competent bird observers frequently into nearly all the country from which Kites have ever been reported or in which Kites could possibly exist. Furthermore these observers are *looking* for Kites and therefore the records here given will be mournfully accurate as evidence of the passing of this most characterful bird from one of its last strongholds in the west. The last record of the White-tailed Kite, as listed in the publication cited above, was on January 25, 1930, in the Arroyo Calero, about ten miles south of San Jose. Birding trips have been made into this Arroyo not less than six times since, but no Kite has been observed.

The breeding ground of 1928 in the Evergreen region, a locality that had three known nests and at least eight birds at that time, was revisited for the first time on February 16, 1930—no Kites! The same region was visited again on April 15, 1930—again no Kites! On September 6, 1930, this region was visited yet again, with the same result. On this occasion Mr. Earland Whaley, a relative of the owner of the property, reported that a single Kite was observed here in 1929, but that none was noted on the nesting grounds. Visits on several occasions in 1931 have all furnished the same sad news—no Kites.

A prolonged and careful birding trip into the region of Loyola Corners and the Los Altos Country Club, and the hills south of Los Altos, a region that has given Kite records on many other occasions, failed to show an individual on March 22, 1930, and no records have since come from there.

Two students of mine reported a White-tailed Kite flying over the San Benito River south of Gilroy on May 2, 1930. No records have come from there since and personal journeys through this region have not shown Kites.

One region only remains in which Kite records have been made with reasonable regularity. This is the valley area lying between San Jose and the Bay. Here Kites have been recorded as follows: March 22, 1930, a single individual; May 22 to June 13, 1930, Kites frequently seen, once three individuals (reported by Alfred Kopp); August 30, 1930, two individuals; September 9 and 14, 1930, two individuals (reported by Albert Ross McDonald); December 20, 1930, four individuals (reported by Emily Smith); May 16, 1931, one individual (reported by Wallace Brierly); July 28, 1931, two individuals; October 3, 1931, one individual (reported by H. G. Hill). These reports of 1931 undoubtedly refer to a single pair of Kites. And so, from a possible sixteen to twenty Kites in 1928, we are forced to estimate that for the entire valley there are now probably not more than two.

There are a few faint rays of hope. First of all, Earland Whaley tells me that the season of 1928 was the first that Kites occupied the area where the several nests of that year were located. They were absent from that vicinity the following year. Can it be that Kites move about in their semi-communal breeding habits and that they now are occupying some foothill region away from roads and observing eyes? The hope is faint. Again that region of the Santa Cruz Mountains that lies to the southwest of Los Altos, a region once favored by Kites, could be more thoroughly explored. Perhaps Kites may still be there.

What has taken the Kites? Between 1928 and 1931 there can have been no marked increase in gunners in this fully settled region. There has been no alteration of breed-

ing habitats. There is therefore no conclusive evidence, though this point of more than passing interest should be made. The Kites have disappeared from the hills and are persisting in the single lower valley region previously occupied by them. It would seem that the destructive factor lies in the foothills. At the risk of reasoning that may be but remotely circumstantial if not entirely fallacious, one may mention that there are no squirrels to be poisoned in the lower valley, but formerly there were many in the foothills. Can there be a relation between the poisoning of the California ground squirrel and the passing of the White-tailed Kite?—GAYLE PICKWELL, *State College, San Jose, California, October 30, 1931.*

Small Pools Dangerous to Cormorants.—On the morning of September 26, 1931, while walking up Susan River, I saw a Farallon Cormorant (*Phalacrocorax auritus albociliatus*) in a small pool about one mile west of Susanville, California. Its plumage was that of an immature bird, dull black and brown. The pond is about four feet deep and not more than fifteen feet in diameter. As I came up to the pond the cormorant was underneath the water catching a fish. When it came to the surface and saw me it coughed up the fish which was about eight inches long. It swam nervously about the pond, frequently diving and swimming under-water. I tossed in a few rocks which caused it to dive more frequently. It did not fly. I returned in about three-quarters of an hour and found it resting on a board sticking six inches out of the water. It took to the water and swam about again.

Twenty-five feet up-stream is an old dam with a longer stretch of smooth water. Perhaps the cormorant flew down to this water and followed the water over the rocks to the smaller pool from where it could not fly. The next day it was not there.

On September 29, by a small pool of the river in Susanville, I found a dead immature cormorant with a stick run through its body. Perhaps it was prompted to enter the pool, from which it could not arise when it was later molested. Small boys probably killed it.—DONALD THOMAS McLAUGHLIN, *Lassen Union High School and Junior College, Susanville, California.*

Two New Records for the Lassen Peak Region.—While engaged in an investigation of the California Quail in the foothill region east of Red Bluff, California, two specimens were taken upon which the following new records for the Lassen Peak region are based.

California Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*). On the morning of July 14, 1930, while writing notes in my shack, a cuckoo was heard calling in some tall cottonwoods along a small stream about 300 yards away. Earlier that morning I had been reading the account of the Road-runner in the galley proof of the Vertebrate Natural History of Lassen Peak Region (Grinnell, *et al.*, Univ. Calif. Publ. Zool., 35, 1930, p. 232) and, upon hearing this cuckoo, remembered that I had seen no mention of the species in this report. A hurried check-up revealed that it was not included, so I immediately set out to collect the bird. Typical of cuckoo nature it was elusive and only after considerable stalking, at times during which it seemed that this record was certainly not going to be made, was I successful in collecting the bird. It was the only cuckoo seen or heard during the three months (May 15 to August 15) that I was in this region.

Paine Creek at this point follows a small well-watered valley which, with the brushy and tree studded banks of the stream, offers a habitat characteristic of the cuckoo's general range. However, a few miles down stream the creek passes through a dry and rocky region that isolates this habitat from any similar one. This specimen is now in the collection of the Museum of Vertebrate Zoology, University of California, catalogue number 58053, collector's original number 962; female with ovaries enlarged; collected, July 14, 1930, three miles west of Payne Creek Post Office, Tehama County, California.

Hutton Vireo (*Vireo huttoni huttoni*). One specimen, Museum of Vertebrate Zoology number 58056, collector's number 1154, male, taken February 15, 1931, at 1200 feet altitude, three miles west of Payne Creek Post Office, Tehama County, California. This species was relatively common at this time, a dozen or more individuals being seen during the three mornings that I was in the field, although none was observed during the three months of the previous summer in the same neighborhood. This record is of especial interest since it serves to establish a connecting link be-

tween the southernmost Cascade record, at Baird (altitude 800 feet), Shasta County (C. H. Townsend, Proc. U. S. Nat. Mus., 10, 1887, p. 223), and the most northern Sierra record, at Grass Valley (altitude 2090 feet), Nevada County (E. B. Richards, Condor, 26, 1924, p. 103).—LAWRENCE V. COMPTON, *Museum of Vertebrate Zoology, University of California, Berkeley, October 16, 1931.*

Some Light on the Introduction of Gambel Quail on San Clemente Island, California.—In his article, "New Records for the Channel Islands of Southern California" (Condor, xxxiii, 1931, p. 219), J. R. Pemberton states that a Gambel Quail (*Lophortyx gambeli gambeli*) was taken on San Clemente Island by A. J. van Rossem on October 25, 1930, but that details of the introduction of this species on the island are lacking.

It may be well to record that on December 13, 1925, the writer took a pair of Gambel Quail, now preserved in the collection of the San Diego Society of Natural History, from a flock of about seventy-five birds on the south end of San Clemente Island. Upon returning to San Diego the question of the introduction of these quail on the island was discussed with Clinton G. Abbott, Director of the Natural History Museum, who wrote for information to E. G. Blair, President of the San Clemente Sheep Company, which was at that time operating a concession on San Clemente Island. Mr. Blair referred Mr. Abbott to Charles T. Howland, who had earlier been interested in the live stock on the island. Mr. Howland's reply was essentially as follows:

"The quail on San Clemente Island were released by us about 1912. We secured, through the Game Commission, twenty dozen, about one-half of which died before being released. They were caught in the Banning-Coachella district and shipped to Los Angeles. It took about two weeks to get them to the points of distribution and although they were fed and watered there was a heavy loss because of their wildness. The first year or so after being released there was no apparent increase but I understand that later the showing was quite fair."

Prior to 1926, it seems that the only quail captured on San Clemente to be recorded in ornithological literature were six specimens taken there by J. Grinnell in May, 1897 (Grinnell, Pasadena Acad. Sci. Publ., 1, 1897, p. 12), all of which were Valley Quail. In the same article Grinnell makes reference to the introduction of quail on the Island, twelve dozen birds having been reported liberated about ten years previously. G. Willett also mentions the Valley Quail as "Occasionally seen on San Clemente" (Pacific Coast Avifauna No. 7, 1912, p. 43).

A. B. Howell (Pacific Coast Avifauna No. 12, 1917, p. 52) states, in dealing with the Valley Quail, that Mr. Howland of San Clemente Island told him that "there were two or three dozen birds liberated there in 1913." One cannot help wondering whether this may not have been the same liberation reported by Mr. Howland in his letter of January 29, 1926, to Mr. Abbott. Inasmuch as he mentions Banning and Coachella as sources of supply it would seem that both Valley and Gambel quail were introduced on the Island about 1912-1913. Recent attempts to get into touch with Mr. Howland for specific information have been unsuccessful.

The writer can say with certainty that the flock from which the two specimens were taken on December 13, 1925, was entirely made up of *L. g. gambeli*.—LAURENCE M. HUEY, *San Diego Society of Natural History, Balboa Park, San Diego, California, October 19, 1931.*

First Record of the Pectoral Sandpiper for Arizona.—On Monday, September 21, 1931, I visited an earthen reservoir or "tank" on the lower, northeastern corner of the Santa Rita Experimental Range, in company with Mr. D. M. Gorsuch, who is carrying on Gambel Quail studies on that Reserve. This reservoir, known on the Range as "Desert Tank" (altitude, 2900 feet), was well filled with water from the summer rains and we examined it with interest for possible water or shore bird migrants.

Two sandpipers, busily feeding in the mud, were the only such birds present, and after a close-up study of them we had to admit that we were at a loss as to their absolute identity. We, therefore, agreed they should be collected, though with regret, since they were so tame and confiding. Accordingly, I collected them and Mr. Gorsuch prepared the skins. They proved to be males, both young, of the Pectoral Sandpiper (*Pisobia melanotos*). This identification has been checked by Dr. J. Grinnell at the Museum of Vertebrate Zoology, University of California.

There seems to be no previous record in the literature of the occurrence of this bird in Arizona. In "Birds of New Mexico" Mrs. Bailey, on authority of W. W. Cooke, says "It was found common September 13, 1886, at Apache, New Mexico (Anthony), and undoubtedly occurs regularly in the fall migration, though there is only the one definite record." If that be true for New Mexico it may well be true also for Arizona, although it does seem strange that this bird should have been definitely recorded but once previously for the two states together. It therefore seems important that this occurrence be recorded and that the species be watched for somewhat more closely by observers in the southwest, definitely to determine its status.—CHAS. T. VORHIES, *University of Arizona, Tucson, Arizona, October 2, 1931.*

Additional Records from Cape Prince of Wales, Alaska.—Several interesting specimens were collected during the past season near Wales, Alaska, by Dwight Tevuk, the representative of the Chicago Academy of Sciences at that place. A breeding record of the Red-throated Pipit was established, with an adult bird, the fourth from North America, taken to substantiate the identification; in addition, a pair of Green-throated Loons (with eggs), and a Dotterel, the third from this point, were secured.

The skins, and the eggs of the pipit, are in the Academy collection, while the eggs of the Green-throated Loon are in the collection of W. C. Hanna, of Colton, California. The data for the skins are as follows:

C. A. S.	5676	<i>Anthus cervinus</i> ♀	Wales, Alaska, June 29, 1931
C. A. S.	5123	<i>Eudromias morinellus</i> ♀	Wales, Alaska, June 6, 1931
C. A. S.	5191	<i>Gavia arctica viridigularis</i> ♀	Wales, Alaska, June 29, 1931
C. A. S.	5192	<i>Gavia arctica viridigularis</i>	Wales, Alaska, June 23, 1931

The nest and eggs of the Pipit (C. A. S. no. 460) were taken June 29, 1931, near Wales, Alaska, "up in the hills on nigger-head", the nest evidently having been concealed in moss and short grass, in a typical manner. The nest is composed throughout of fine, light brown, hairlike, long grasses, save that the rim is of coarser and, apparently, more weathered blades and stalks. The outside diameter of the nest measures $3\frac{1}{2}$ inches and the inside $2\frac{1}{4}$ inches, while the depth outside is $2\frac{1}{4}$, and inside, $\frac{1}{2}$.

The four eggs are somewhat dull, resembling lighter types of Bobolink's eggs. The ground color is a light drab, indeterminately washed or blurred with grayish brown, these markings appearing irregularly in heavier, darker spots, as usually in specimens of eggs of the Vesper Sparrow. The eggs measure in millimeters: 20.8 x 15.4; 20.9 x 15.2; 20.7 x 15.2; 20.6 x 15.2.

The preparation indicates that incubation was not far advanced. There are only three previous records of the Red-throated Pipit from North America, according to the Fourth Edition of the A. O. U. Check-List (St. Michael, 1867, Aleutian Islands at an earlier date, and Lower California, January 26, 1883).

The Dotterel is the third from Wales, the other two having been taken June 15 and 19, 1929 (Condor, xxxii, 1930, p. 161).

Several sets of eggs, with the nesting Green-throated Loons, have been taken at Wales within the last few years, so the form is well established as a breeding bird of the western coast of Alaska. They nest on the same ponds with *Gavia arctica pacifica*, but in the specimens I have examined I have failed to find signs of intergradation.

I am indebted to Mr. Outram Bangs, who identified the above specimens, and to Mr. E. R. Ford for his description of the nest and eggs of the Red-throated Pipit.—ALFRED M. BAILEY, *The Chicago Academy of Sciences, November 1, 1931.*

The Red-eyed Vireo in Los Angeles, California.—For several years the Gambel Sparrow (*Zonotrichia l. gambeli*) has made its appearance on our premises in Los Angeles on the morning of October 10; and on this date in 1931, as I was in quest of this yearly migrant, I found a dead bird floating on the water in a bucket under a dripping hydrant. Being in good condition, it was presented to the Los Angeles Museum, where it was identified as the Red-eyed Vireo (*Vireo olivaceus*). It proved to be a male and is now specimen number 17517 in the Los Angeles Museum.

The only other California record for this species that I have seen was from San Diego (Condor, xvii, 1915, p. 58).—GLORIA WIDMANN, *Los Angeles, California, November 4, 1931.*

An Erroneous Record for the Peruvian Booby.—In a recent publication dealing with birds of the Galápagos Islands (Fisher, A. K., and Wetmore, A., Report on Birds Recorded by the Pinchot Expedition of 1929 to the Caribbean and Pacific, Proc. U. S. Nat. Mus., 79, Art. 10, 1931, p. 32) the present writer is responsible for the identification of a booby collected by A. K. Fisher on Tower Island, June 14, 1929, as *Sula variegata* (Tschudi). Dr. Robert Cushman Murphy has called my attention to the fact that earlier records of *variegata* from the Galápagos have been erroneous, and on reexamination I find that the specimen in question is in reality an adult female of *Sula dactylatra granti* Rothschild (Bull. British Orn. Club, 13, October 31, 1902, p. 7). Though Rothschild in the description of *granti* and in a subsequent paper (Bull. British Orn. Club, 35, January 27, 1915, p. 44) has called attention to the proper identity of these boobies from the Galápagos, they have been recorded by several recent authors as *variegata*. It was through following these that error was committed, as I had overlooked the description of *granti*, and National Museum material of true *variegata* is very limited. *Sula variegata* is not known to occur in the Galápagos. —ALEXANDER WETMORE, United States National Museum, Washington, D. C., November 7, 1931.

A Probable Hybrid between the California Quail and the Texas Bob-white.—On August 10, 1930, while preparing captive-bred California Quail for release, I discovered an individual that appeared to be a hybrid between the California Quail (*Lophortyx californica*) and the Texas Bob-white (*Colinus virginianus texanus*). This bird was placed aside for examination at some later time but unfortunately was released before this examination was made. A description of its characters, therefore, depends upon memory of the few observations made originally.

The beak was heavier, blunter, and the upper mandible more rounded, than in the California Quail and was typically that of the Bob-white. A short topknot or plume of the type found in the California Quail was present, although a whitish throat and line over the eye gave the head a Bob-white appearance. The rest of the bird presented a generally similar combination of characters of the two species. This individual was possibly the offspring of a single female Texas Bob-white which had been confined in a pen with approximately four male and eight female California Quail.

This observation is offered with the realization that it is quite problematical but with the hope that it will stimulate watchfulness on the part of game propagators for the occurrence of another such case of hybridization. —LAWRENCE V. COMPTON, Museum of Vertebrate Zoology, University of California, Berkeley, November 7, 1931.

The Arizona Hooded Oriole in San Jose, California.—On July 21, 1930, Mrs. Pickwell called my attention to a bird of unusual demeanor sitting atop a tall radio aerial support, two houses to the north of our dwelling in San Jose. The unusual character and behavior of the bird was at once apparent. It maintained this position for several minutes and was definitely identified as the Arizona Hooded Oriole (*Icterus cucullatus nelsoni*). The bird continuously called an *eep, eep, kurt* series of notes, the while it flitted its tail. The black face, lemon-yellow rump, black wings with inconspicuous white bars, black tail and deep yellow underparts were clearly noted. This bird is not listed in Grinnell and Wythe's "Directory to the Bird-life of the San Francisco Bay Region."

It is of great interest to see that, about two months after the above record was made in my notebook, two other occurrences of this bird for the Bay region were reported. In the May meeting of the Northern Division of the Cooper Club (Condor, XXXII, 1930, p. 268) appeared the report by Leslie Hawkins of a possible Arizona Hooded Oriole in Reliez Valley; and by Gordon Bolander of the same species in Oakland. —GAYLE PICKWELL, State College, San Jose, California, November 4, 1931.

The Summer Tanager Again in California.—On the morning of November 8, 1931, my casual gardening duties about the home place in the Westwood district of Los Angeles were interrupted by a more instinctive reaction. (Gardening may not be an instinct at all, but the hunter instinct is deeply implanted in the human complex.)

The call note of the Summer Tanager (*Piranga rubra*) sounded from a grove of trees three hundred yards away. A "bee line" toward the source of sound brought me up against a six foot fence with three strands of barbs on top. Fortunately the bird was but forty feet beyond and was easily observed with the field glass for a period as it captured insects.

Parts of May, June, and August of the past summer were spent in the Arizona range of *Piranga rubra cooperi* and a considerable series of females and juvenals was examined, hence that subspecies was quite well visualized in my mind. The bird under observation was in dull plumage of very dark shade, and with distinct reddish brown cast particularly on the crissum, just such a tone of plumage as is seen in females and young of *P. r. rubra*, and was apparently identical with the individual of the race collected in the Arroyo Seco in Los Angeles on March 2 [not "10"], 1919 (L. Miller, Condor, XXI, 1919, p. 129). On August 29 of the same year an adult male of the same subspecies was collected at my home on Arroyo Seco. Both specimens were deposited in the Museum of Vertebrate Zoology at Berkeley. It is not out of order to expect the Summer Tanager, then, on rare occasions during either the northward or the southward migration, and the bird under observation is judged to be of that race. During the remainder of the morning the call notes were heard on two other occasions. The note of the Hepatic Tanager is entirely different.—LOYE MILLER, University of California at Los Angeles, November 22, 1931.

Wholesale Poison for the Red-wings.—The following notes, formerly withheld from publication, are printed as a result of the announcement in the press, of a war of extermination against crop-eating birds in Stanislaus County, California (see p. 54). The notes were written by me on May 21, 1931, in the so-called Nigger Jack area, twelve miles north of Marysville in the Sacramento Valley, California, on the farm of Wilbur Smith. The local representative of the Biological Survey, United States Department of Agriculture, stationed in the district under orders to develop effective methods for the large-scale destruction of blackbirds by poison, had chosen this site to experiment upon.

The ground selected for the "experiment" consisted of several acres of cat-tail rushes growing in water of various depths, fringed on certain aspects by a miniature forest of willow trees, growing in clusters and up to twenty or more feet in height. This ground, too, was flooded at the time, so that the trees stood in six or eight inches of water. The whole was surrounded by fields of hay and grain, or fallow ground prepared for similar crops or for rice, with a single muddy slough where Great Blue, Anthony Green, and Night herons, Egret, Bittern, Black-necked Stilt and Coot were feeding at the time of our visit. Perhaps owing to the disturbance which had been created by the vast rookery of Tri-colored Red-wings, the song birds were few and restricted almost entirely to Song Sparrows and Yellow-throats. At the time when the work had been initiated, two or three weeks before, the number of nesting blackbirds had been immense. The number of birds which crossed a single very limited sight-line past one corner of the swamp had, during one period of observation, been about 170 a minute.

I do not care to record in detail the minutiae of the technique employed, further than to say that grain poisoned with strychnine was placed on a small area of clean plow-ground close to the swamp, following several baitings with clean grain, which had attracted the birds and accustomed them to feeding on the spot. When the poison was finally placed, the effect was appalling. Great numbers died at once on the poison-ground, where within a very small radius 1700 dead birds were tossed into a central pile. Later the surface of the shallow water beneath the willows became an almost solid floor of floating bodies where the observers hesitated to enter because of the stench which hung in the quiet air. Weeks later the bases of the cat-tails were awash with countless dead. At the time of our visit, May 21, the remainder of the grain was still doing its work, for fresh as well as decayed birds were still in evidence, often hanging, caught in the branches or clinging with the death grip of one foot, from the trees and from the nests in the rushes.

The destruction of adult birds, however, was much the smaller fraction of the total effect. As is often the case in large Tri-color rookeries, the nests were roughly divisible into groups. Only in two extremely small areas in the rushes had the eggs

not hatched. Elsewhere the vast majority contained either new-hatched young or fledglings nearly ready to leave the nest. The enormous number of nests in the willows (a single tree contained 34) were not closely investigated. In the rushes, one might have spent a day forcing his way through the tall, dense greenery, with from two to five or six nests continually within reach, yet leave untouched larger areas where no locomotion but swimming was possible. Yet judging from the small fractions I had time to cover he could hardly have found a dozen nests in which the young were alive and vigorous. Of the hundreds of broods I saw, all, practically speaking, were either dead (the vast majority) or feebly alive in some stage of starvation or grilling and parching by sunburn. A few evidently healthy adults were still passing in and out of the swamp, but the usual noisy cloud of enraged parents no longer hung over the invader's head.

"Estimates" of numbers of birds, where the whole flock cannot be seen at one time, are among the most absurd of the wild guesses on which naturalists too often rely, and the writer dislikes making one in the present case. We have, however, some basis in the laborious and extremely complete counts which have been made in similar rush or tule swamps where we have banded the nestlings. On May 30 and 31 of the same year, for example, we banded 2150 nestlings in rookeries whose total area would amount to a negligible fraction of the one in question, and which were much less densely inhabited. Applying this rough unit of measurement as best I can, and including the adults, a total of 30,000 birds destroyed seems to me very conservative. All were of the uniquely Californian species, *Agelaius tricolor* Audubon.

In the present case it is my intention to chronicle, not to discuss. A single point, however, my field experience with the Sacramento red-wings inclines me to press. This species possesses a limited and peculiarly vulnerable breeding range, largely in the populous and agricultural Sacramento and San Joaquin valleys. The rookeries are large and correspondingly few, and with the technique employed in this case, the total extermination of the bird, or the reduction in numbers which spells extermination, would be a matter of the utmost immediate simplicity; nay, considering the policy of concealment which too often shrouds the movements of this branch of the Government, this very thing may be taking, or have taken, place at this moment.—T. T. McCABE, *The Faculty Club, Berkeley, California, August 17, 1931.*

EDITORIAL NOTES AND NEWS

The regular biennial membership roster of the Cooper Ornithological Club will be printed in the coming May issue of the *Condor*, which will go to press on or before April 15. Corrections of address, or any other information pertaining to membership, should be sent to Mr. John McB. Robertson, Buena Park, California, who is compiling the manuscript for the roster.

It is proper for the Editors of the *Condor* to make acknowledgment from time to time of helps received from fellow Cooper Club members in the publishing of our magazine. We are therefore glad now to make record of the services of Miss Selma Werner in preparing the Index for the last year's volume—just as she has done for the several years preceding. Also we have been helped in following-to-copy on proofs by Miss Margaret W. Wythe and Miss Susan E. Chattin.

At the Detroit meeting of the American

Ornithologists' Union, October 19, 1931, the West was again given recognition, this time in the election to Membership of Mr. Clinton G. Abbott, Director of the Natural History Museum of San Diego. Four other members were elected: Mr. Oliver L. Austin of North Eastham, Massachusetts; Mr. W. Wedgwood Bowen of Philadelphia; Mr. Bayard H. Christy of Pittsburgh; and Mrs. Margaret Morse Nice of Columbus, Ohio. Since much of Mrs. Nice's bird work has been done in Oklahoma, we are almost justified in claiming her election, too, as a "plume" for the West.

The death of Dr. David Starr Jordan took place at Stanford University, September 19, 1931, when he was past eighty years of age. For many years he was a Cooper Club member, and in other ways he showed warm interest in ornithology. This was most in evidence when Jordan was a young man, as set forth in the

pleasant reminiscences of him by Dr. Barton Warren Evermann in the present issue of the *Condor* (p. 6). Indeed, as in the cases of so many other men who have reached scientific prominence in their later years, bird study in the field doubtless constituted a profitable phase of his intellectual development.

It is a pleasure to express publicly our hearty commendation of the work being carried on in California by Mr. George Tonkin, United States Game Protector, under the Federal Migratory Bird Treaty Act. Especially during the curtailed hunting season just passed there was much infraction of various of the game laws. In particular, the now wholly protected shore-birds came in for much disturbance. In a number of such cases the malefactors were brought to justice, this affording wholesome influence in curbing more widespread illegal killing of birds. Because Mr. Tonkin's headquarters are in Berkeley, we happened to have opportunity of observing the effectiveness of his methods. No doubt the other Game Protectors in the West have been similarly active. This arm of the work of the U. S. Biological Survey is a most important one for wild-life conservation.

Volume II of the "Scientific Publications of the Cleveland Museum of Natural History" consists of a technical treatise upon methods of taking "Measurements of Birds" (165 pp., 151 figs.). The authors are S. Prentiss Baldwin, Harry C. Oberholser, and Leonard G. Worley; the excellent line drawings here reproduced were done by James M. Valentine. This finely printed brochure constitutes, further, "Contribution No. 17 from the Baldwin Bird Research Laboratory, Gates Mills, Ohio", and it was "Issued, October 14, 1931". The need for just this sort of manual for exact and uniform measuring of birds has long been felt. Mr. Baldwin and his co-workers have met this need in admirable and authoritative fashion. We recommend its adoption as a guide everywhere that careful systematic work with birds is contemplated or is under way. The price is only \$1.85, bound and carriage prepaid, which, of course, nowhere near repays actual cost of publication, thanks to the generosity of Mr. Baldwin toward the ornithological public. Copies may be had from the Cleveland Museum of Natural History, 2717 Euclid Avenue, Cleveland, Ohio.—J.G.

On the occasion of Professor William E. Ritter's seventh-fifth birthday, November 19, 1931, numerous written expressions of good will and appreciation were sent him by friends and colleagues in the University of California. One of these felicitations, addressed to him from his associates in the Museum of Vertebrate Zoology, read as follows:

The naturalist now, and down from the days of Aristotle, strives to find out the meanings of things-animate. The first step is to see and to record things as they are; then comes the effort to explain what has been seen, to derive implications in-the-large. Such effort at its best involves a mental ability to perceive the widest range of facts and interrelationships and to marshal these in various ways until acceptable interpretations become apparent. All this procedure constitutes what may be called reflective zoology, or more specifically, interpretative natural history.

Within the ken of a number of us, Professor Ritter has become far and away the most prominent exponent in this field of interpretative natural history. In his painstaking manner of watching woodpeckers in the field, of monkeys in their cages, of beavers in the parks, to see *what* they *do*, and *why*, we have had set for us a naturalistic pattern of high standard. It was a fortunate day for those of us who work under the auspices of the Museum of Vertebrate Zoology when Dr. Ritter came to occupy a room within our precincts. Here we, each of our group individually, have had the privilege of hearing almost week by week the results of his findings, and especially of watching the workings of a mind eagerly seeking explanations and yet conscientiously concerned to handle facts and inferences accurately.

These present lines, then, are written as being in the nature of an acknowledgment—of Dr. Ritter's immediate influence among us other, junior workers in the field of vertebrate natural history. We are sincerely sensible of the benefits we have one and all derived from his association with us. We are confident that the plane of *our* observing and of *our* reflecting upon what *we* have observed has been greatly raised by his example.

This, be it emphasized, is a *local* influence, through personal contact—quite a different matter from the far-reaching influence upon the thought of the times through Dr. Ritter's many publications. Yet, down through the future years this

local influence, we venture to hope, will extend quite as surely in ever lengthening radius.—J.G.

Friends of the American White Pelican will be glad to know that warden service has now been provided for the largest existing nesting colony of these birds. This colony, on Anaho Island in Pyramid Lake, Nevada, has for a number of years been a bird reservation, but it has been without actual protection until the summer of 1931, when Mr. Charles C. Cooper, of Sutcliffe, Nevada, was employed by the Biological Survey as warden for the three months of June, July and August. Through long residence at the Lake, Mr. Cooper is familiar with local conditions as they affect White Pelicans, and in addition he has a genuine interest in the birds themselves. Under his guardianship, it is expected that the colony, which has been seriously interfered with for the past several seasons, will again produce the normal number of young. It was hoped by many bird students that the fantastic rock formations at the northern end of Pyramid Lake, locally known as The Needles, also would be set aside as a wild life refuge. Here the Lake's quota of Farallon Cormorants, California Gulls, and a majority of the American Mergansers nest. In response to pleas for protection of these birds, a bill, H. R. 13276 "To Establish the Needles Rocks Wild Life Refuge," was introduced into the House of Representatives of the second session of the Seventy-first Congress of the United States. Although passed by the House of Representatives on January 5, 1931, this bill was, so far as we have been able to learn, never brought up in the Senate. It is greatly to be hoped that the measure will be more successful in the new session of Congress. Anaho Island and the proposed Needles Rocks Wild Life Refuge are included within the boundaries of an Indian Reservation. This is perhaps fortunate, inasmuch as the Bureau of Indian Affairs now is making an effort to have the winter flow of the Truckee River again, as it did naturally, enter Pyramid and Winnemucca lakes. At the present time, the water is diverted into a dry sink where it is of but slight benefit. Each of the two mentioned bird colonies is suffering because of the lowering of the lake level. Inasmuch as raising the water level seems to be the key here to remedying unfortunate conditions (as they

have to do not only with trout fishing, with agricultural pursuits of the Indians, with nesting grounds for wild fowl sought in autumn by hunters, but also with the nesting water birds) it is greatly to be hoped that the Bureau of Biological Survey will join with the Bureau of Indian Affairs in requesting that the normal flow of water in the Truckee River, at least in winter, be returned to these lakes.—E.R.H.

THE DETROIT MEETING OF THE A. O. U.

The Forty-ninth Stated Meeting of the American Ornithologists' Union convened in Detroit, October 19 to 23, 1931, at the Book-Cadillac Hotel. The holding of sessions in a hotel was an innovation at first regarded with distrust by members accustomed to the museum setting of previous meetings. The carefully worked out plans of Mrs. Etta Wilson, Chairman of the local committee, proved conclusively, however, that a background of zinc cases is not a necessary adjunct to a wholly successful meeting of bird students.

Monday, October 19, ushered in the meetings with a pleasant prologue of greetings in the lobby between old friends and the making of new acquaintances. To many of us the keenest pleasure was to meet Althea R. Sherman, whose carefully made and zestfully recorded notes have instructed and entertained us for many years. Monday afternoon and evening were occupied with the session of the Fellows, twenty-two being present at their dinner, and with the meeting of the Fellows and Members. All the old officers were re-elected. Since there were no vacancies to be filled no proposals of Fellows had been made. From among the list of Associates proposed for advancement to the rank of Members five were elected: Clinton G. Abbott, A. O. Austin, W. W. Bowen, B. H. Christy, and Mrs. M. M. Nice. A pleasant innovation was the ladies' dinner, held at the same time as the Fellows' dinner and ably presided over by Mrs. Wilson.

Fifty-four papers were listed for presentation at the public meetings, and in the adjacent parlors was an exhibition of 64 paintings and 72 photographs, all of exceptional merit. Among the paintings the "Ruffed Grouse" by Walter A. Weber, attracted, we believe, the largest number of favorable comments. The group of 15 original paintings made by Francis

L. Jaques for Arthur H. Howell's forthcoming book, "Florida Bird Life", showed that the illustrations will be in accord with the expected high quality of the text. As loyal Westerners we regretted the absence of work by Major Brooks, but hope to find it represented next year at Quebec.

On Tuesday morning the first general session was held and its outstanding feature was the announcement of the award of the Brewster Medal to Florence Merriam Bailey in recognition of her "Birds of New Mexico". In the afternoon there were both general and technical sessions, and in the evening two illustrated talks were given at the Detroit Institute of Arts, the first by George M. Sutton on his "Year on Southampton Island", the second by Alfred M. Bailey on "Louisiana Wild Life". Of Tuesday's program two presentations stand pre-eminent in the reviewer's memory: first, Professor Herrick's superb film "The Eagle in Action", portraying the rearing of their young by a pair of Bald Eagles. These birds were photographed day after day from a tall tower erected for the purpose. Second, A. R. Brand's "Preliminary Report of a New Method of Recording Bird Song". Some very good reproductions were given by means of phonograph records and then the producing apparatus proving refractory the program was announced as concluded and the room was almost emptied when Mr. Brand called out "Wait a minute, it's working now." We turned back and were rewarded by a film showing a Pied-billed Grebe in the swamp with her two downy young. As we watched the chicks climbing her steep and slippery sides to refuge beneath her wings we heard every encouraging "cluck" the mother gave, as well as the croaking of a nearby frog and the more distant song of a Red-winged Blackbird. It was an exquisitely perfect bit and promises much for those photographers of the future who have the patience to abandon sound-proof studios and contend in the open with the multitudinous sounds created by humanity until they find a brief moment when Nature reigns uninterrupted.

Wednesday's sessions were held in the new Museum of Zoology of the University of Michigan at Ann Arbor. Of especial interest to us were: Myron Swenk's "Present Status of the Whooping Crane", his counts in Nebraska encouraging the hope that these cranes are at least holding their own; and W. J. Breckenridge's "Court-

ship Performances of the Canada Spruce Grouse". Mr. Breckenridge presented stills and moving pictures of this grouse in its normal habitat, totally unaware of the photographer's presence—the ideal type of bird photography and the antithesis of I. H. Johnston's work in his film entitled "Road-runner and Hummingbirds", which was given the next day.

The annual dinner was held Wednesday evening in Detroit with more than 200 in attendance, including local guests, and with Dr. Alexander W. Blain presiding as toastmaster.

On Thursday morning both technical and general sessions were held. At noon the members went by machine to Cranbrook as luncheon guests of the Cranbrook Institute of Science. Here the last three papers of the meeting were given and a tour of the estate was made. The beautiful surroundings, harmoniously furnished school buildings, and the matchless Christ Church, won the admiration of all who made the trip.

Friday, October 23, was devoted to excursions by machine over the Ambassador Bridge into Canada and along the King's Highway to Jack Miner's and Point Pelee. As we were anxious to reach the Point early in the day our host and guide, Mr. W. E. Saunders, drove past Jack Miner's without stopping, but so slowly as to give us an excellent view of the setting which attracts his famous birds.

We arrived at the long, narrow sand-spit which terminates the point in time to see something of the migration of hawks across Lake Erie, which we were told is always at its best before noon. We found it fascinating to watch the landward sky and see hawk after hawk come into view. During the hour and a half that we remained we counted fifty Sharp-shinned Hawks, ten Marsh Hawks and about fifteen Cooper Hawks. Flocks of Starlings crossed, and companies of Crows came out, wheeled indecisively and went back again, waiting for clearer skies. Under Mr. Saunders' experienced guidance we saw on the wooded portion of the point many trees and plants new to our western eyes, heard unfamiliar bird songs, and smelled the fragrance of old apple orchards at harvest time. All too soon the day ended, and with its close ended the Forty-ninth Stated Meeting of the A. O. U.

Two things remain to be said: First, to express our appreciation of the capable way in which Mrs. Etta Wilson, Chair-

man of the Local Committee, carried out the arrangements which made for the great success of the meeting, and the thoughtfulness with which Mr. and Mrs. W. B. Tyrrell looked after the interests of all who came from a distance. Second, to call attention to the very cordial invitation brought to the Union on behalf of Quebec by Mr. Adrian Falardeau, who promises to all who attend next year a very jolly time, such as made the first Canadian meeting, at Ottawa, so memorable.—HILDA W. GRINNELL.

CURRENT DISCUSSION

THE "CONTROL" OF BIRDS AS CAUSING POPULAR DISREGARD FOR THE VALUES OF BIRD-LIFE

Examination of the accompanying "exhibit" (fig. 8) will inform our readers concerning several features in the present deplorable onslaught of "economic" forces against birds as well as other wild animal life. Only one or two of these features will be given special consideration in the discussion I now undertake.

An observed tendency of human kind is to look at other associated sorts of animals, largest to smallest, those that are not directly and immediately usable for food, as *enemies*; there is in man a seemingly deep-grounded reaction to "fight Nature". "It's alive, damn it—kill it" epitomizes this primitive, unreasoning state of mind. With little doubt this innate attitude owes itself fundamentally to our early racial history, even down to pioneer times only a few years back, when people's efforts to "wrest from the soil" their livelihood were more or less frustrated by the activities of numerous competitors among other animals. Anyway, the animus against animal life is, with most men, *there*; it is innate, and operates toward blind action until and unless suppressed through the acquiring of increased intelligence and of intelligent appreciation of animal life—an understanding of the inter-relationships which obtain complexly and with usually mutual benefit in a multitude of directions among living things.

That the economic situation human-wise is now largely different from what it was in pioneer and early agricultural days has been clearly shown by Tyler in his article in the last *Condor* (vol. 33, pp. 258-259), as well as by many other writers in recent periodical literature. But the instinctive urge to practice destruction of non-"useful" animal life keeps welling up in very

many directions. I would here refer to the thoughtful essay by Mr. W. L. McAtee, on "vermin" as defined by the sportsman, in the last issue of *Bird-Lore* (vol. 33, pp. 381-384). McAtee's quoted saying of sportsmen, "What isn't game must be vermin", could be paraphrased from common remarks of the fruit-grower, the grain-raiser, and the sheep-man. An attempt to instruct in animal conservation very often brings the retort "What good is it?" Unless one can prove it positively and immediately "good", it must be bad!

Referring again to the accompanying newspaper clipping: The influence of that kind of publicity finds in most persons only unconsidered response to *approve*. Any popular regard for the values of bird-life as may slowly have been fostered by educational agencies like our schools and the Audubon societies, is quickly undermined by "economic" agencies whose activities give origin to such publicity. With huge facilities at the command of these agencies for strengthening public opinion naturally adverse to animal life, and with loyal field agents who seek to discover and to meet every local demand for "extirpation" of a supposed pest (and such "demand" readily responds to stimulation), the future for maintenance of our bird-life for its true economic, its esthetic, and its scientific, values is indeed black. If my understanding of human behavior be correct, the limit of destruction will only be reached (if the present policy of Federal and State "economic control" persists) when every kind of bird that is claimed to do damage anywhere will have been subjected to a degree of "control" only limited by the degree of ingenuity of salaried specialists to discover virulent poisons and effective means of feeding these to the victims.

I am tempted to refer to one more point suggested by the clipping—the ingenious "pre-bait" stage in extermination proceedings. This is also fully described by Mr. McCabe elsewhere in the present issue of the *Condor* (p. 49). In essence, this is the setting out of a feeding-table for the birds, so as to get them to coming to a given spot from far and near. Then, poisoned baits are put on this spot—with "wonderful" results, from the control standpoint! And this is, of course, most effective in the *nesting* season of the birds! Was there ever anything equally diabolical devised in the days of the feather trade? [Ask the National Association of

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CROP RAIDING BIRDS WILL BE EXTERMINATED

Stanislaus Officials to Open Warfare Using Poison to Rid County of Bird Pests

PATTERSON, Oct. 22.—Stanislaus county prepared today for a battle to the death against birds that prey on crops—horned larks, blackbirds and linnets.

Commander-in-chief of the warfare will be S. E. Piper of the United States Biologic survey. Assisting him will be a man to be hired by E. T. Hamlin, county agricultural commissioner, with ranchers on the firing line.

Authorization for Hamlin to employ a man to work for four or five months in the warfare was given by the board of supervisors after a committee representing the farm bureau had requested county aid. Many thousands of dollars of damage annually is caused by the birds in their attacks on fruits of all kinds, Hamlin said.

This is the way the campaign will be waged:

Ranchers will put out bait to attract the birds that do crop damage. This is known as the pre-bait period.

Then Piper and his aide will go into action by placing grains treated with poisons for the enemy. The government, Hamlin said, will furnish the ammunition after the pre-bait period. The art in the warfare lies in killing only the birds that attack crops and not those that are harmless, according to Hamlin. Heretofore, drives against blackbirds, horned larks and linnets have not been marked by success because more innocents than the open enemy were killed.

Audubon Societies!] I am assured that last spring in one orchard over 3000 California Linnets were thus "successfully" poisoned in the course of an *experiment* to "improve" methods of control!

A characteristic of birds is their mobility—as contrasted with the more or less sedentary mammals. A man may poison off all the gophers and ground squirrels on his ranch, and the population of these animals elsewhere be not immediately affected. But with birds the case is vitally different; under the "pre-bait" method of attracting birds to a given spot for poisoning, not only the individuals on the one ranch are killed, but also individuals from neighboring ranches, from school yards, from public parks, from the uncultivated lands at more or less distance away; and levy is made, in one profit-seeking interest, upon the values of those birds to many other people far and wide. This, I maintain, is pre-eminently *wrong*. The principle here done violence to is definitely recognized in many long-established relations between human beings, and it should be heeded with equal justice here. No matter what the individual profit at stake, the interests of the greatest number of the people properly must be served.

Cannot our agricultural administrators, those at least who have already committed themselves to a policy of animal *conservation*, see the situation in this light, and cease entirely from encouraging animal destruction—put an end to their program of bird-killing and at the same time apply their powerful resources for popular education toward improvement of public regard for bird life, instead of debasing it?—J. GRINNELL.

PUBLICATIONS REVIEWED

REPORT ON BIRDS RECORDED BY THE PINCHOT EXPEDITION OF 1929 TO THE CARIBBEAN AND PACIFIC. By Albert K. Fisher and Alexander Wetmore. Proceedings U. S. National Museum, vol. 79, art. 10, pp. 1-66, pls. 1-10.

The following remarks are in the nature of a personal reply to certain disputed propositions rather than a dispassionate review of this report, but they have a general application to publications of the sort that perhaps justifies their appearance in this form. The "report" is concerned with a collection of birds, some 500 specimens, from many widely scattered island localities, from Key West to Tahiti.

Fig. 8. REPRODUCED FROM CLIPPING FROM OAKLAND TRIBUNE, "VALLEY EDITION", OCTOBER 22, 1931. AN EXAMPLE OF THE KIND OF PUBLICITY WHICH RESULTS FROM THE ACTIVITIES OF "CONTROL" AGENCIES.

Dr. Fisher, who collected the specimens, supplied field notes and observations; Dr. Wetmore is responsible for the classification. The particular section in which I (the reviewer) am interested is that dealing with the Galapagos Islands. The Galapagos avifauna has been the subject of my careful study for several years past, and while naturally I make no claim to having said anything approaching the last word on this subject, I can not believe that I have gone so completely astray as would be inferred from comparison of my own conclusions with the remarks of Fisher and Wetmore. There is hardly any particular of importance in which we agree. For example, they say: "The avifauna of the Caribbean islands and that of the Pacific islands are so essentially different that for convenience the report that follows is presented in two sections, the Isthmus of Panama serving as the dividing line between the two geographic regions considered." That the Galapagos avifauna is mostly of Caribbean affinities seems to me so clearly demonstrable as to be beyond dispute, yet no hint is given even that others hold this view.

In the treatment accorded the Galapagos land birds there is inconsistency of classification that is not explained and that I can not understand. In *Geospiza*, *Camarhynchus*, and *Platyspiza*, treatment follows "that of Ridgway in part 1 of Bulletin 50 of the United States National Museum," where no trinomials are used; but in the closely related *Certhidea* and in *Pyrocephalus*, Ridgway's course is abandoned and trinomials are resorted to in a manner that it would be hard to justify.

The family that I have recently proposed, the *Geospizidae*, is discredited in the following words: "After due consideration of the alleged characters we are unable to find trenchant grounds for separating these [genera] from the *Fringillidae*"—rather cavalier treatment to be accorded the results of careful study. The proper rebuttal might be that "after due consideration" I still think I am right, but perhaps a degree of personal reputation and official position is needed to support such a stand. At any rate, since the publication of the preliminary paper in which the family *Geospizidae* was erected, and immediately preceding publication of the Pinchot report (too recently for citation therein), my finished study of Galapagos birds has been published, with de-

tails concerning the various disputed points above mentioned, and anyone interested is referred to that paper.

On my first reading of the Pinchot report I found a curious and pleasing archaic flavor that was puzzling until it dawned upon me that here was a lineal descendant of the publications resulting from various naval expeditions of the early nineteenth century—of the "Sulphur", the "Venus", the "Beagle", and others. These books still retain almost the first interest of their rich harvest of new facts and new species gleaned here, there, and everywhere, but it is hard to understand the point of such a report at the present time. Unless, perhaps, it is to let it be known that the United States National Museum has obtained an extremely valuable collection of birds prepared with Dr. Fisher's unrivalled skill. For it may be pointed out in passing that Dr. Fisher, if anyone, deserves the editorial encomiums in a recent issue of *The Condor* regarding individuals who have achieved the highest degree of skill in the technique of collecting.

The upshot of my study of this report is an emphatic query as to the extent to which one can accept the statements even of men of unquestioned attainments and ability on subjects to which we are not sure they have given careful consideration. In the present case I am prepared to dispute nearly all the statements made concerning the classification of Galapagos land birds, and to accept implicitly, on faith, everything pertaining to the taxonomy of West Indian birds. But am I not justified in being reluctant to accept unquestioned the arrangement of difficult groups from certain still other far distant islands? Is not a miscellaneous, wide-ranging report of this nature necessarily of uncertain and varying authority in different sections, where classification is concerned, however much of value may lie in the field notes accompanying the specimens?

Regarding these same field notes, Dr. Fisher describes a trick of *Larus fuliginosus*, of perching upon the head of a pelican and, when chance offers, purloining a fish from the pelican's full pouch. This same habit, in some Florida species of gull, was described and illustrated many years ago in "St. Nicholas", though I can not recall seeing it mentioned in any purely ornithological literature. It was with a most pleasant thrill that I found

one of my childhood "fables" thus verified!—H. S. SWARTH, *California Academy of Sciences, San Francisco.*

HACHISUKA'S BIRDS OF THE PHILIPPINE ISLANDS.¹—A pleasing color reproduction of a painting by H. Grönvold faces page 1 and illustrates three Palawan peacock pheasants in this first part of a new work on Philippine birds, which is expected to be completed in five parts.

The preface is restricted to less than three pages. Geography and climate are discussed on fourteen pages in a brief, adequate outline of physical features, climate in general, rainfall and humidity—the last illustrated by a folded unnumbered map, with the mean annual rainfall in various areas of the Archipelago clearly indicated in shades of blue.

The chapter on ornithological history reviews in easy informal style the work of the various expeditions and individual collectors connected with ornithological field work in the Philippines. Numerous extensive quotations, such as those about the field work of Steere, Everett, and Whitehead, and the author's comments, here and there, help to make an interesting chapter of a somewhat dull subject. Under Everett, page 22, the author mentions Monte Alban, so spelled by Everett, which is probably the town now called Montalban and about 40 kilometers from Manila; and "San Matteo," usually spelled with one t, 10 kilometers nearer Manila. Some of the notes about Dean C. Worcester, page 30, are confused. Worcester died May 2, 1924, not 1914.

The third chapter, "A short account of the author's journey to the Philippines," extends from page 53 to page 95 and is illustrated with most of the plates in this part of the book. There is also a folding map, unnumbered, of southern Mindanao showing the routes traveled by the author. Most of the plates illustrate subjects of general interest.

The notes on mammals are scattered through this chapter. The following species are noticed: *Tarsius philippensis*,

page 85, and *Chirolestes torquatus*, page 87. "Cooper" is, unfortunately, printed "Hooper" on page 55. On page 66 a species of *Rhipidura* is mentioned as *nigro cinnamomea* and a few lines below *cinnamomea nigro*, neither of which is quite correct.

A bibliography, arranged by years, totals 327 numbered titles and contains many interesting annotations. There is also a short list of titles of general interest, mostly on ethnology, geography, history, and travel. Another list enumerates the author's papers.

The systematic account begins on page 150 and follows Sharpe's Hand-list as to the sequence of the families and higher groups. Both scientific and English names are provided for each species and subspecies. The synonymy is restricted to a few necessary entries. The paragraphs with side heads are Distribution, Description, Nidification, General Notes and Habits. A useful paragraph under some species lists "allied forms and their range." The following are illustrated: *Megapodius freycinet cumingi* and *Turnix sylvatica whiteheadi*, plate 23; *Gallus gallus gallus*, plate 24; *Turnix worcesteri* and *T. sylvatica whiteheadi*, heads only, unnumbered text figures. Three subspecies of *Megapodius* are recognized; namely, *M. freycinet cumingii*, Palawan, Balabac, Labuan, etc.; *M. f. pusillus* Tweeddale, the Philippines in general; and *M. f. tabon*, a new name for the birds of Mindanao. *Megapodius cumingii toluilis* Bangs and Peters, of Maratua Island, is said to be the same as *M. f. pusillus*. *Polyplectron emphanum* Temminck is revived for the peacock pheasant. Under *Francolinus pintadeanus pintadeanus* it may be noted that the locality "Balagbagin, Rizal" should read "Balagbag, in Rizal." Five of the button quails are listed as subspecies. *Turnix fasciata nigrescens* Tweeddale, of Cebu, is revived. In a foot note, page 167, *Turnix sylvatica mikado*, from Formosa, is characterized as new.

This book is pleasing in typography and convenient in size. It promises to be of great value to anyone wishing to study Philippine birds. The author has had the great advantage of collecting many specimens of Philippine birds and then being able to work on them in the British Museum. Unfortunately, the edition is small and the price will discourage most amateurs from buying it.—R. C. MCGREGOR, Bureau of Science, Manila, P. I.

¹ The Birds | of the | Philippine Islands | with notes on the mammal fauna | By | The Hon. Masauji Hachisuka | [etc., 5 lines] | Part I | Pages 1 to 168 | [decoration] | H. F. & G. Witherby | 326 High Holborn, London, W. C. 1 | 16th March 1931. Super-royal octavo, 25.5 cm., pp. 68, 24 pls. (1 colored), 2 colored maps (unnumbered), 2 text figs. Received in the Bureau of Science library May 14, 1931. To be completed in five parts. Price per part 25/- net.

MINUTES OF COOPER CLUB
MEETINGS

NORTHERN DIVISION

SEPTEMBER.—The Northern Division of the Cooper Ornithological Club held its regular monthly meeting on Thursday, September 24, 1931, at 8:00 p. m., in Room 2003 Life Sciences Building, Berkeley, California, with Vice-president Linsdale in the Chair and sixty members and guests present. August minutes of both divisions were read and those of the Northern Division corrected and approved. Mrs. Ede M. Van Dwyne, Secretary of the California Cat Welfare Association, 2237 Parker St., Berkeley, California, was proposed for membership by the Secretary.

A communication from the California Cat Welfare Association was read stating its aims and requesting the approval and cooperation of the Cooper Club. Mr. Grinnell moved that the Chair appoint a committee of three to consider the matter and report at the next meeting. The motion was duly seconded and unanimously carried. The Chair later reported the appointment of Mrs. A. S. Allen (chairman), Miss Cornelia C. Pringle, and Mr. Ben Thompson.

Mr. Linsdale, permanent chairman of the Committee on Bird Conservation appointed in 1929, presented for consideration a report. Mr. McCabe moved the adoption of the report and his motion was duly seconded. The Chairman asking for remarks, Mr. Grinnell stated that he would like to hear the opinion of Mr. Ira N. Gabrielson, a visiting member of the Club from Oregon. Mr. Gabrielson stated it to be his conviction that we must face the fact that as agriculture becomes intensified wild bird life must decrease, but that during the fifteen years of his residence in Oregon he believes that needless and incidental destruction of birds has lessened. Mr. Sumner, Sr., and Mr. Bunker added to the discussion and Mr. McCabe read a report, to be published elsewhere, revealing the slow death through sun and starvation suffered by thousands of young of the Tri-colored Blackbird, following the "experimental" poisoning of the adult birds. Mr. Grinnell offered a substitute motion, to replace the one before the meeting, empowering the Chairman to appoint a committee of three to read the report of the Conservation Committee and to return a recommendation to the Club at the October meeting

of the Northern Division. This motion was duly seconded and carried. The Chairman subsequently announced this committee to consist of W. I. Follett (chairman), B. C. Cain, and Paul F. Bunker.

Reports from the field were: Charles Bryant, six Pileated Woodpeckers seen at Mount Cobb on September 6; two male and one female of Wood Duck on Phoenix Lake, September 13; one pair of Western Tanagers, two Pied-billed Grebes feeding half-grown young, and one Black Rail, near Lake Merced, September 20. Mr. Bunker, the observing of four California Gulls directly diving into Fallen Leaf Lake on August 23, a matter of special note after having for ten years watched them "side-slip" into San Francisco Bay. Gordon Bolander, the seeing of a Lewis Woodpecker and a Tolmie Warbler in Mosswood Park on September 21. Mrs. Allen suggested that those who had read in the current *Condor* of the nesting of the Mockingbird in Contra Costa County would be interested in knowing that just now there are four Mockingbirds in the garden of Mrs. Edwin T. Blake on Rincon Road, Berkeley.

Dr. Walter P. Taylor of Tucson, Arizona, present at the meeting, cordially renewed his invitation to the Club to hold an annual meeting in that city.

Speakers of the evening were Mrs. G. E. Kelly and Mr. Ben Thompson. Because of the lateness of the hour both speakers curtailed their planned accounts of summer observations. Mr. Thompson told vividly of the environments in which five pairs of Sandhill Cranes and one young of that rare species were seen by him in Yellowstone Park. Mrs. Kelly spoke especially of the almost tropical environment which Lake Placid of the Adirondacks furnishes in summer for birds which winter in the Canal Zone of Central America, and of the efficient way in which the American Museum is providing help to nature students along the trails of Bear Mountain Interstate Park.

Adjourned.—HILDA W. GRINNELL, Secretary.

OCTOBER.—The regular meeting of the Northern Division of the Cooper Ornithological Club was held in the Life Sciences Building, Room 2003, Berkeley, California, at 8 p. m., on October 22, 1931. President Wright presided and about thirty members and friends were present.

September minutes from both divisions were read and those of the Northern Division were approved. Mrs. Louise Hatton, Box 942, Salinas, California, was proposed for membership by O. P. Silliman.

Mr. Cain announced that the Audubon Association is inaugurating a monthly series of Saturday afternoon trips afield for beginning students—each one to be held on the Saturday following the regular Sunday trip. Junior Audubon Leaflets for the year were exhibited by Mr. Cain.

Dr. Evermann reported that the advisory board had recommended that the Fish and Game Commission acquire, for a Duck and Goose Sanctuary, 2000 acres on Joyce Island with the hope that the sanctuary will begin to function this season. A dyked embankment surrounding the area provides an automobile road from which the whole tract can be easily patrolled.

Mrs. Allen presented the following report from the committee appointed at the last meeting to consider the proposal of the Cat Welfare Society:

"Your committee has considered carefully the request of the Cat Welfare Association that the Cooper Ornithological Club indorse their movement to procure legislation to protect cats belonging to owners who are willing to purchase tags for their pets and to mercifully dispose of strays. We feel that this legislation is desirable but that enforcement of it would require the machinery of a State or Federal bureau such as the State Fish and Game Commission or the Bureau of Biological Survey. The cat, we believe, cannot be caught, kept in captivity, fed, or disposed of simply by making use of existing pounds arranged for the handling of other domestic animals. To ask for legislation which would become a dead letter as soon as passed seems to us an undesirable step to take. If one city could work out a practicable method of handling the problem, other cities would no doubt follow suit and the movement would gradually spread. State legislation with enforcement carried out only by a few city pounds would seem to us far from ideal."

By vote of the members present the report was accepted, a copy to be placed on file and one to be sent to the Cat Welfare Society.

Mr. Follett, Chairman of a committee appointed at the September meeting to consider recommendations submitted by

Jean M. Linsdale on conservation problems, presented a report which advised the adoption of the recommendations. Dr. Alden Miller moved the adoption of Mr. Linsdale's report. The motion was seconded and then discussed at length by Mr. Jacobsen, Dr. Miller, Mr. Follett and Dr. Evermann. Mr. Jacobsen then proposed a substitute motion that Mr. Linsdale's report be laid on the table. This motion was seconded and carried, by a vote of 9 to 6.

Under observations Mr. Cain exhibited the nest of a Junco built on a narrow ledge from which much of the material dropped to the ground. One pound and eight ounces of this material, almost two cubic feet, was a fine exhibition of excess zeal on the part of the Junco. Mr. Sumner reported the banding of an Eastern Fox Sparrow in Strawberry Cañon on October 20—the seventeenth record of this bird in California.

Mr. Chas. Bryant reported about 100 Golden-crowned Kinglets and two large flocks of Band-tailed Pigeons seen during the course of a long walk in Marin County on October 4, and on October 18 the presence of two Water-thrushes at a muddy settling tank near the Rodeo Lagoon.

The speaker of the evening was Mr. George Tonkin who spoke on "Game Birds and Federal Laws". He referred to the Migratory Bird Treaty as a treaty which will still be in operation after many others have become dead letters. After giving the history of the treaty and describing the machinery of enforcement he referred to the interesting work which is being done by each branch of the Biological Survey in its research work and the different methods used to protect the game birds.

Adjourned.—AMELIA S. ALLEN, *Secretary pro tem.*

SOUTHERN DIVISION

SEPTEMBER.—The regular meeting of the Cooper Ornithological Club, Southern Division, was held at the Los Angeles Museum, Exposition Park, Los Angeles, Tuesday evening, September 29, 1931. Vice-President Harold Michener presided and there were about sixty-five members and friends present. The minutes of the August meeting of the Southern Division were read and approved; the minutes of the August meeting of the Northern Division were read.

Applications for membership were read as follows: Miriam S. Faddis, 1942 Le Moyne St., Los Angeles, proposed by Mrs. Ben L. Clary; A. W. Gardiner, 1010 Standard Trust Bldg., Cleveland, Ohio, proposed by W. Lee Chambers; Dr. Ralph M. Crumrine, Los Angeles General Hospital, Los Angeles, proposed by Loye H. Miller; and Eugene Hester, R. F. D., Dade City, Florida, proposed by Oscar E. Baynard.

A letter was read from the American Game Association giving an outline of their plan to prevent a recurrence of the present waterfowl crisis; another letter was read from the International Hunting Council, with headquarters in Paris, asking for funds to help carry on their work. No action was taken on either letter.

A. J. van Rossem spoke in place of Dr. Loye H. Miller, who was unable to attend because of illness. The subject of his talk was the birds seen on recent trips into southern Arizona, made by himself, Dr. Miller and others, for the purpose of working out the boundaries of the main faunal areas along the Mexican border. Among the most interesting birds observed were the owls, the following species having been found in the several regions worked: Mexican Screech Owl, Spotted Screech Owl, Flammulated Screech Owl, Pigmy Owl, Elf Owl, and Arizona Spotted Owl. Of these, only the Spotted Owl could be located at night by eye shine. The Poor-will and the Stephens Whip-poor-will were found to be easily located by the red reflections from their eyes when a spot light was turned on them. Among the other birds mentioned were the Texas and Western meadowlarks, the White-necked and Western ravens, Zone-tailed Hawk, Azure Bluebird, and Coppery-tailed Trogon.

The speaker answered a number of questions and then the meeting was adjourned so that everyone could examine more closely a number of skins that were displayed.—JOHN MCB. ROBERTSON, *Secretary*.

OCTOBER.—The regular meeting of the Cooper Ornithological Club, Southern Division, was called to order by President J. R. Pemberton at 8 p. m., Tuesday, October 27, 1931, at the Los Angeles Museum, Exposition Park, Los Angeles. There were about thirty-five members and

friends present. The minutes of the September meeting of the Southern Division were read and approved, the minutes of the September meeting of the Northern Division were read.

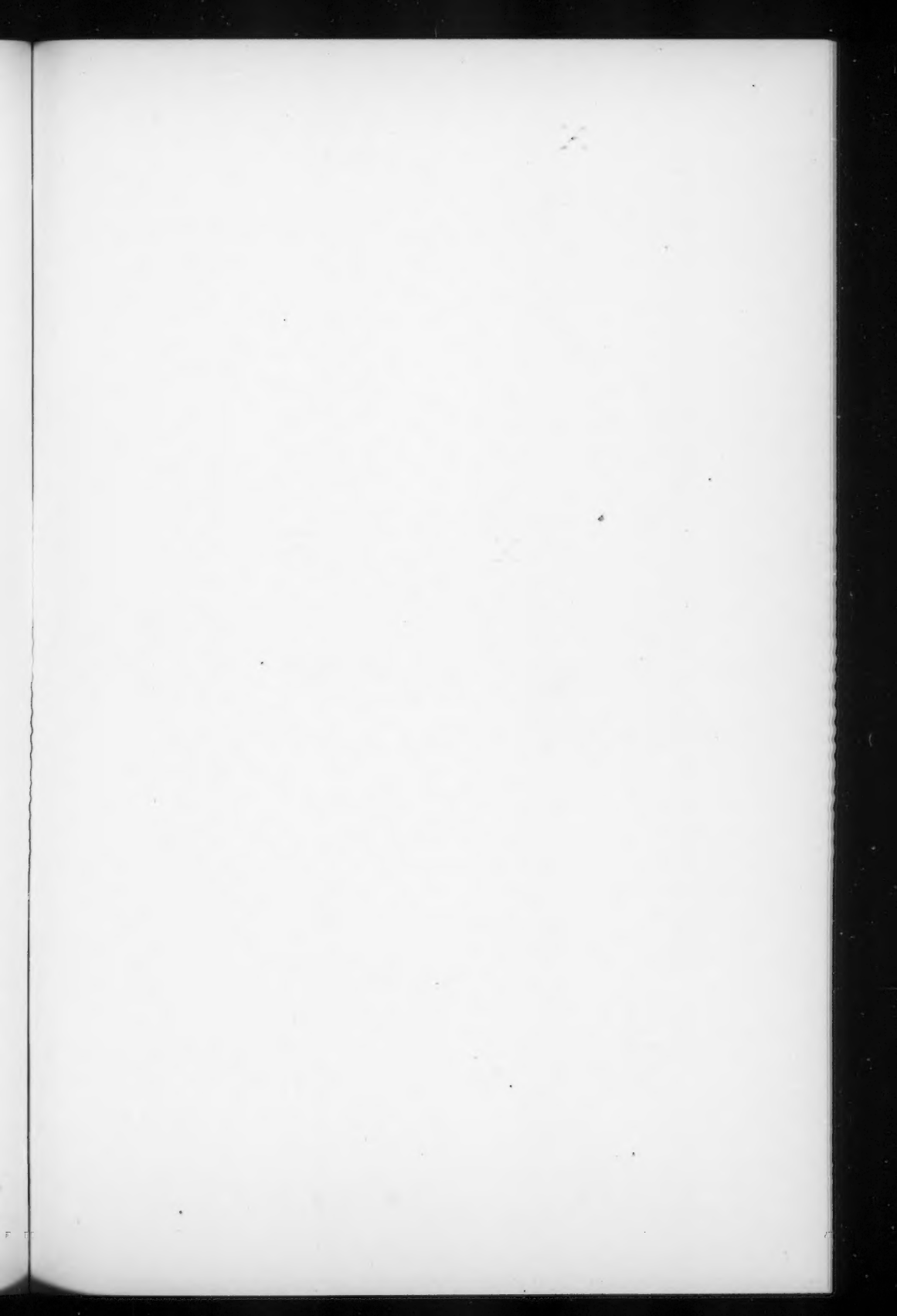
Applications for membership were read as follows: Eugene Marcelin Verges, 2nd, 1126 Beacon St., Brookline, Mass., proposed by W. Lee Chambers; and William K. Ryan, 1661 Crescent Place, N.W., Washington, D. C., proposed by John MCB. Robertson.

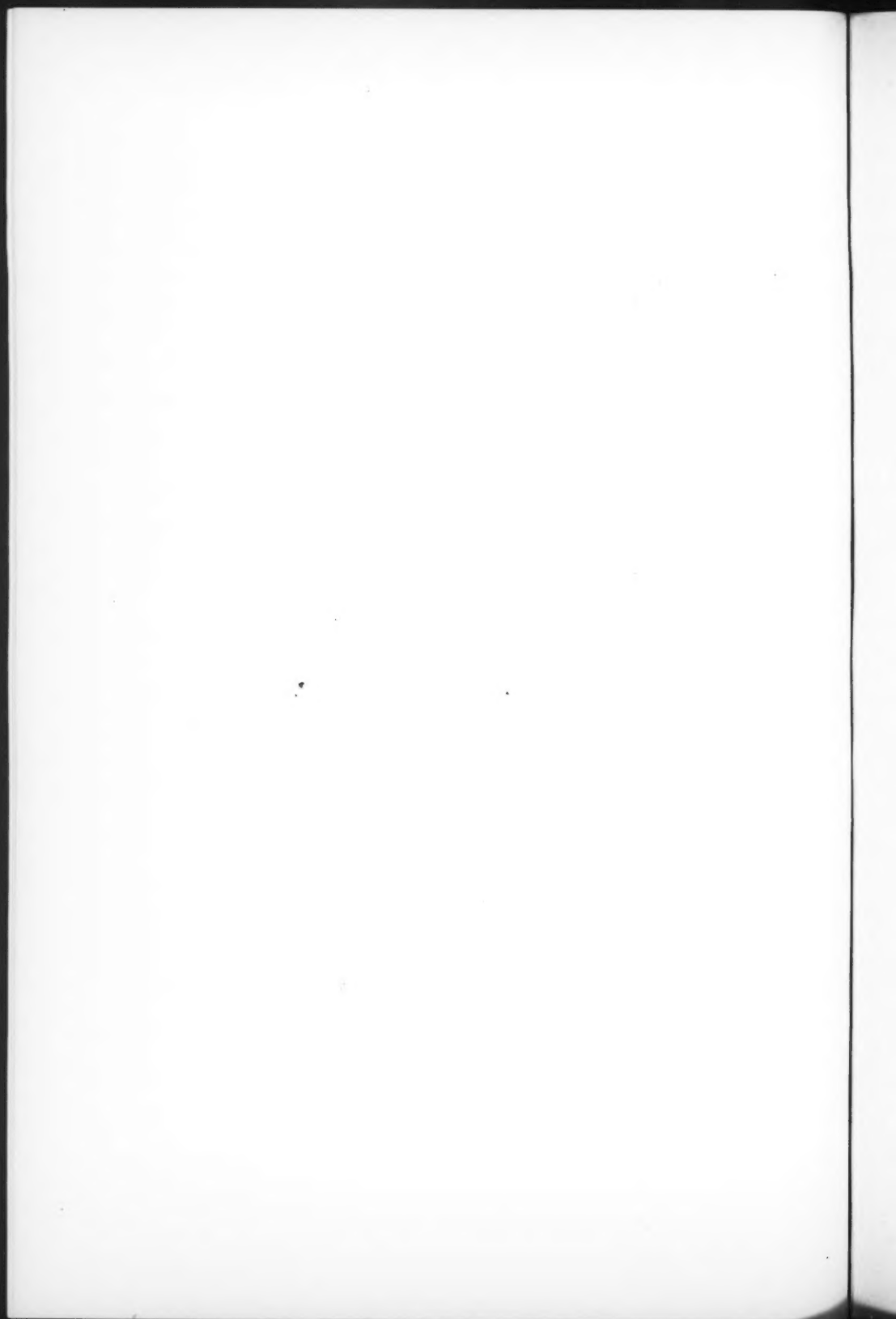
A letter from the National Research Council was read, inviting the Cooper Club to appoint a delegate to represent the Club at the Fifth Pacific Science Congress, to be held in Victoria and Vancouver, British Columbia, between May 23 and June 4, 1932. No action was taken, but it was suggested that the Secretary get in touch with the Northern Division and bring the matter up again at a future meeting.

Dr. Leon Patrick made a brief announcement of the organization of the Whittier Ornithological Academy under the auspices of Whittier College, for the purpose of propagating species of birds that are nearing extinction in the wild. Pamphlets giving more of the details of this new organization were distributed.

The speaker of the evening was Mr. George H. Corsan, who for four years was in charge of the development of the W. K. Kellogg Bird Sanctuary near Augusta, Michigan. Mr. Corsan's talk was notably interesting and amusing and dealt mostly with his methods of controlling predatory animals and with feeding and tree planting and other phases of his work on the sanctuary. Because of a misunderstanding, through which the wrong size of projector had been provided, he was unable to show his own moving pictures; but a reel of pictures of Jack Miner's sanctuary at Kingston, Ontario, was shown and commented upon. Jack Miner's work in Canada furnished the inspiration that led Mr. Kellogg to establish his sanctuary.

Mr. Corsan is now at Whittier, and developments there under the new Academy will be watched with interest by all who are concerned with aviculture. A number of questions were answered by Mr. Corsan and then the meeting adjourned.—JOHN MCB. ROBERTSON, *Secretary*.





For Sale, Exchange and Want Column.—Any Cooper Club member is entitled to one advertising notice in each issue free. Notices of over ten lines will be charged for at the rate of 15 cents per line. For this department, address JOHN MCB. ROBERTSON, Buena Park, California.

WANTED FOR CASH—"North American Birds Eggs" by Chester A. Reed.—ED N. HARRISON, Box 324, Encinitas, California.

FOR SALE—"Birds of North and Middle America", Parts I-VIII, by Robert Ridgway. Original covers. Will sell at a reasonable figure.—S. PAUL JONES, 509 West Ave. No., Waukesha, Wisconsin.

WANTED—Lists of duplicates: books, magazines, or bulletins on natural science, especially on birds and mammals. I am in the market for many items not already included in my library.—JOHNSON A. NEFF, Bureau of Biological Survey, Marysville, California.

FOR EXCHANGE—A copy of my book, "Birds of Virginia", 1913; and "Birds of Florida", 1926; for bird or mammal skins, or sets of eggs. Also a few Florida bird and mammal skins and sets of eggs to exchange.—HAROLD H. BAILEY, 206 Exchange Bldg., Miami, Florida.

WANTED—Quite a complete series of studies of the Bald Eagle, photographic, pencil, or any other medium, showing profile, talons, form and feather arrangement of wings and tail, both upper and lower surfaces. Want only adult bird with white head and fully developed tail feathers. Prefer pencil studies by careful observer.—OTTO HOLSTEIN, Apartado 1833, Mexico City, D.F., Mexico.

FOR SALE—The Mirakel Binocular, 7X, weight 6 oz., and 8X, weight 10 oz., price \$35.00. Sport glass, price \$16.50. Free trial.—MISS HELEN S. PRATT, 2451 Ridge View Ave., Eagle Rock, California.

CONDOR—Broken set for sale. Complete: Vols. 1 to 8, 12 to 16, 18, 19, 25, and 28 to 32. Missing: Vol. 9, nos. 5 and 6; vol. 10, nos. 4 to 6; vol. 11, nos. 1 to 4; vol. 17, no. 1; vol. 20, nos. 5 and 6; vols. 21 to 23, entire; vol. 24, no. 1; vol. 26, nos. 4 to 6; vol. 27, no. 1. First reasonable offer accepted.—VERNON KELLOGG, National Research Council, Washington, D. C.

THE BIRDS OF WASHINGTON, by Dawson and Bowles, is now rare. One or two examples of the various editions, two volumes each, may still be had for prices ranging from \$35.00 to \$150.00.—MRS. FRANCES E. DAWSON, Santa Barbara, California.

FOR SALE—A small collection of books from the library of the late O. W. Howard. In this collection is a nice lot of odd magazines and a few sets of rare birds' eggs.—MRS. O. W. HOWARD, 719 Alpine Drive, Beverly Hills, Calif.

FOR SALE—Copies of "Field Book of Birds of the Southwestern United States", by L. E. Wyman and E. F. Burnell. Illustrated. Cloth, \$3.50; leather, \$5.00.—A. P. WYMAN, 3965 Dalton Ave., Los Angeles, Calif.

FOR SALE—Beautiful enlargements from the rarest of bird negatives: Arctic Three-toed Woodpecker, Hudsonian Chickadee, Lincoln Sparrow, White-winged Junco, and others, but chiefly, Western Solitary Sandpiper, eggs in nest of Brewer Blackbird, Idaho, only nesting, I believe, on record. Summer address.—REV. P. B. PEABODY, R. 6, B. 55a, New Richmond, Wis.

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